NETWORK WORLD

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Reach enters the realm of work flow

By Timothy O'Brien
West Coast Bureau Chief

SUNNYVALE, Calif. — Reach Software Corp. will announce next week what it claims is the first LAN-based work flow software designed to automate the way in which information is organized, routed and processed in a company.

WorkMAN includes a set of tools and a run-time environment to build client/server applications that manage the processing of business tasks, as well as the flow of information and forms over an enterprisewide network.

Reach has built its WorkMAN platform to work with local-area network-based mail systems, using electronic mail as a transport mechanism to route messages containing task-specific data.

"Work flow is based on the idea of an intelligent data highway that knows how to get the right information to the right person at the right time," said Anand Jagannathan, president and founder of Reach.

WorkMAN lets users create forms, such as a check request or a purchase order, which are then sent around the network attached to E-mail messages. The work flow process includes instruc-

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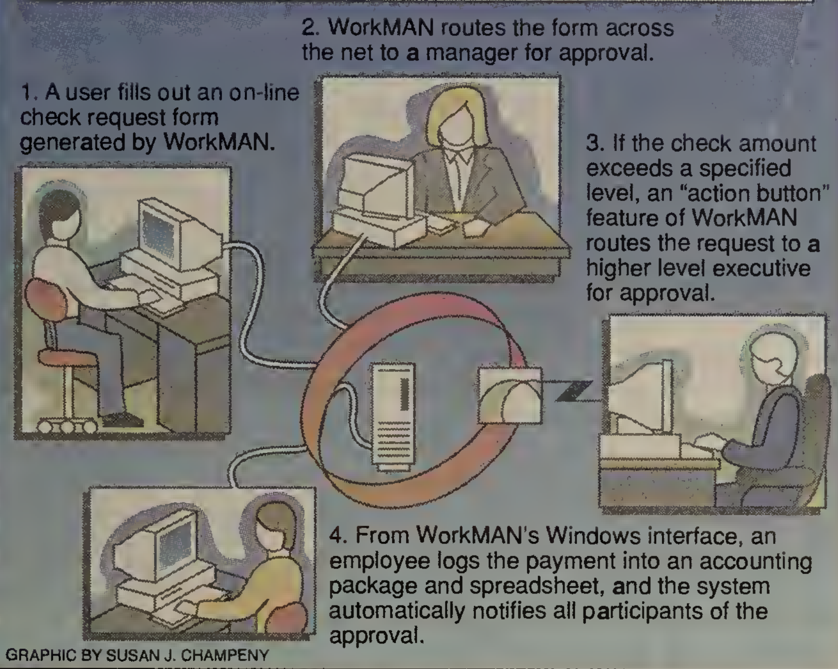
How work flow works

Work flow automation software, such as Reach Software Corp.'s client/server WorkMAN, could dramatically simplify handling of documents, including payment requests.



1. A user fills out an on-line check request form generated by WorkMAN.

2. WorkMAN routes the form across the net to a manager for approval.

3. If the check amount exceeds a specified level, an "action button" feature of WorkMAN routes the request to a higher level executive for approval.

4. From WorkMAN's Windows interface, an employee logs the payment into an accounting package and spreadsheet, and the system automatically notifies all participants of the approval.

GRAPHIC BY SUSAN J. CHAMPENY

Microsoft's LAN Manager plans may herald NOS shift

First in a three-part series examining Microsoft Corp.'s networking strategy.

By Timothy O'Brien
West Coast Bureau Chief

When Microsoft Corp. announced recently that it would try to bolster its network strategy by leveraging its popular Windows product, it revealed the first sign of a larger evolutionary shift that could eventually redefine the concept of server-based network operating systems as we know them.

Analysts say Microsoft is working to integrate existing LAN Manager functionality directly into Windows and Windows NT, the 32-bit operating system scheduled to debut late next year. At the same time, Microsoft is developing a range of advanced services for Windows that will add distributed net capabilities, such as directories and messaging.

(continued on page 6)

IBM, SynOptics devise 802.5 wiring scheme

Vendors to offer proposal to IEEE for supporting token ring over unshielded twisted-pair cabling.

By Bob Brown
Senior Editor

WHITE PLAINS, N.Y. — IBM and SynOptics Communications, Inc. last week said they plan to unveil products based on jointly developed technology for 16M bit/sec token-ring local-area networks on unshielded twisted-pair wire.

Both companies will attend today's IEEE 802 plenary committee meeting in Fort Lauderdale, Fla., and jointly propose their new unshielded twisted-pair technology for inclusion in the IEEE 802.5 token-ring standard.

The proposal marks a departure for IBM, which had previously only supported 16M bit/sec token-ring LANs on shielded twisted-pair wire. The company had, in fact, downplayed other vendors' early efforts to support high-speed token rings over the less expensive and more ubiquitous unshielded twisted-pair wire.

IBM has supported 4M bit/sec token ring on both shielded and unshielded wire since the mid-1980s. But user demand for a low-cost wiring solution for high-speed rings finally persuaded the vendor to join the fray.

"We feel this is going to give token ring the shot in the arm that 10Base-T gave Ethernet a year ago," said Curt Dunbar,

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Opening up Europe

A key European Community office has backed reforms to ease private networking.

The changes would:

- **End private-line restrictions.**
- **Require carriers to offer a common set of dedicated services.**
- **Loosen controls on satellite nets.**

See story, page 2.

GRAPHIC BY SUSAN SLATER

ILAN's new algorithm is boon to SNA

By Paul Desmond
and Maureen Molloy
Network World Staff

MARLBOROUGH, Mass. — CrossComm Corp. is testing an enhancement to its ILAN bridge/router that will improve its performance and rerouting capabilities for SNA and other traffic in token-ring internetworks.

The enhancement will add support for a new routing algorithm, based on the Shortest Path First (SPF) family of routing algorithms, that will improve load balancing and give ILAN nodes the ability to route around failed links in less than 10 seconds.

That's fast enough to preserve established Systems Network Architecture sessions and other types of sessions, said Tad Witkowicz, president of CrossComm, based here.

The company is currently test-

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NETLINE

RBHC STRANGLEHOLD on the local loop could end by 1999, carriers and regulators say. Page 4.

NEW SOFTWARE expands user access to DBMSs in SNA, TCP/IP environments. Page 5.

NET OUTAGES STRIKE the Big Three, keeping net vulnerability at the top of the Washington agenda. Page 5.

INGRES DBMS ENHANCED to offer improved performance in client/server network environments. Page 6.

HP CONSULTING service to help users make the move to open systems. Page 6.

NETWORK INNOVATOR Robert Gallager can be credited with changing the face of communications coding. Page 68.

NEWSPAPER

FEATURE

The ISDN conundrum: Is it already too late?

By Daniel Briere
and Bruce Guptill
Special to Network World

Sometimes it seems as if ISDN is a technology that came and went without much fanfare. This is because users could employ existing switched and dedicated services to obtain many of the features ISDN promises to deliver.

However, Integrated Services Digital Network technology is now starting to deliver on its original promise to support several features on a single circuit, thanks to a change in how carriers market the service and recently announced pricing incentives.

Unfortunately, ISDN has been marketed for years by carriers as the ultimate in telecommunications services, an approach that has blurred its original charter.

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DEC to unwrap Pathworks pack for office automation

Pathworks-Plus allows developers to link Windows clients to office applications on Pathworks server.

By Jim Duffy
Senior Editor

PASADENA, Calif. — Digital Equipment Corp. is expected this week to unveil software for Microsoft Corp. Windows-based workstations connected to a DEC Pathworks server that will provide the underpinnings for a LAN-based office automation environment.

At a Pathworks developers' conference here, analysts expect DEC to unveil Pathworks-Plus, a package of services and program interfaces that will enable developers to write office automation applications for Windows clients in a Pathworks net.

The announcement is being viewed by analysts as a prelude to a larger local-area network-based office automation system founded on DEC's All-In-1 strategy. It also indicates that DEC and Microsoft are cementing their fledgling development relationship to gain a foothold in corporate accounts by leveraging their respective desktop and enterprisewide networking strengths.

"This is part of a bigger picture," said Ann Palermo, director of office systems research at International Data Corp. in Framingham, Mass. "DEC is extending its reach to office systems on the LAN. They're opening up availability to users who haven't

(continued on page 70)

EC ministry backs reforms to open up private nets

Requires member countries to drop many restraints.

By Barton Crockett
Senior Editor

BRUSSELS, Belgium — A high-level arm of the European Community last week voted to support two key reforms designed to eliminate major technical and regulatory restrictions hampering the deployment of private nets in Europe.

The European Community's Council of Telecommunications Ministers unanimously backed a directive that would force carriers in Common Market nations to eliminate private-line usage and configuration restrictions, as well as offer one-stop shopping and billing services and a common set of private-line services.

The council also adopted a resolution calling for the Commission of the European Community (CEC) to draft regulations mandating free competition in the supply of satellite earth stations and services throughout the Common Market.

"This is certainly appreciated because the conditions now are so bad," said Ernst Weiss, chairman of the International Telecommunications Users Group (INTUG)-Europe in Montrichard, France.

The Council of Telecommunications Ministers, the European Community's top net policy-making group, sets network regula-

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Novell reworks NetWare to address design limitations

By Caryn Gillooly
Senior Editor

PROVO, Utah — Novell, Inc. last week acknowledged it is working to solve design limitations within NetWare that impede users from making the most of network bandwidth, particularly on wide-area networks.

Novell officials declined to elaborate on what changes might be forthcoming, but sources familiar with the vendor's efforts said it is grooming the NetWare Core Protocol and Internetwork Packet Exchange (IPX) protocol to enable users to pack more data at faster rates over local- or wide-area network lines.

John Edwards, Novell's marketing director, would only say the vendor, based here, is working on "a technology that will provide improvements in how customers use their bandwidth on both local- and wide-area links."

Novell is addressing customer complaints that NetWare is too slow to use over a WAN and unable to take advantage of T-1 bandwidths, for example, that transmit data at 1.544M bit/sec.

"IPX and [NetWare Core Protocol] were designed with local communications in mind," said

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Briefs

Buyer's Guide Index on-line. *Network World* last week added a new feature to its electronic bulletin board service, a downloadable index to Buyer's Guide articles that have appeared in the newspaper starting in 1989. The index lists the subject of the Buyer's Guide along with the issue date. For information on using the service, see the Contents below.

IBM routers on the way. IBM next month is expected to formally announce its long-awaited line of RISC System/6000-based routers along with a new management system to monitor and control the devices. Sources close to the company said IBM's router announcement will include few, if any, changes from the statement of direction the company delivered in August ("IBM reveals plan for multiprotocol routers," *NW,* Aug. 19).

That means the routers are not likely to support full Systems Network Architecture routing, which would require support for PU Type 4. The first software version will support an SNA encapsulation scheme as well as the Transmission Control Protocol/Internet Protocol, Novell, Inc.'s Internetwork Packet Exchange, frame relay and source routing bridging, sources said. Subsequent releases will add support for Apple Computer, Inc.'s AppleTalk and Digital Equipment Corp.'s DECnet.

IBM is also expected to formally unveil the AIX- and RS/6000-based management system that resulted from its licensing of Hewlett-Packard Co.'s OpenView in April. The system will use the Simple Network Management Protocol (SNMP) to control the new routers and other devices with SNMP agents, and is designed to beef up IBM's support for management of TCP/IP networks.

Ascend to join BONDING. Ascend Communications, Inc. last week said it will join a start-up consortium that is developing a standard for interoperability among inverse multiplexers. Ascend's decision to back the Bandwidth on Demand Interoperability Group (BONDING) effort unites the market leader for inverse multiplexers with other vendors and eases concern that separate standards would emerge. BONDING last week also received a boost from the Switched Digital Services Applications Forum (SDSAF), another vendor consortium whose charter is to promote interoperability and use of switched digital products and services. SDSAF agreed at a meeting in Atlanta to endorse BONDING's standards development effort.

AT&T slates new Definity deliveries. AT&T last week said during an analysts' meeting that it will roll out new models of its Definity digital private branch exchange in January and July. AT&T said Definity G3i, which will support a maximum of 1,600 lines and 400 trunks and can handle 10,000 busy-hour call attempts, will be available in late January. The Definity G3r, which will support 10,000 lines and 4,000 ports and can handle more than 100,000 busy-hour call attempts, will be available in July. AT&T declined to divulge pricing for the Definity G3 models.

N.Y. Merc plans after-hours net. The New York Mercantile Exchange last week said it has signed up AT&T and Task Management, Inc. to build an after-hours electronic trading network the exchange plans to cut over by the end of 1992. The net will run from 5 p.m. to 8 a.m., after the trading floor is closed.

Users will enter trades from terminals on their premises that will be routed over a dedicated network to an on-site host backed up by a host on AT&T's premises in Rochelle Park, N.J.

FCC report faults AT&T mgmt. The Federal Communications Commission last week released a report strongly critical of AT&T management decisions that contributed to a major public net outage in the New York area on Sept. 17.

The FCC pointed out that AT&T's decision to send all members of a power monitoring group to an off-site training meeting while the carrier was managing an electrical power cutover with Consolidated Edison Company of New York, Inc. represented "inadequate management oversight" and was a key contributor to the outage.

The FCC report ordered AT&T to submit an analysis within 30 days of whether it will continue to take service from power utilities in "power-shedding agreements." In the future, AT&T will have to submit risk/benefit analyses to the FCC before implementing power cutover arrangements. Z

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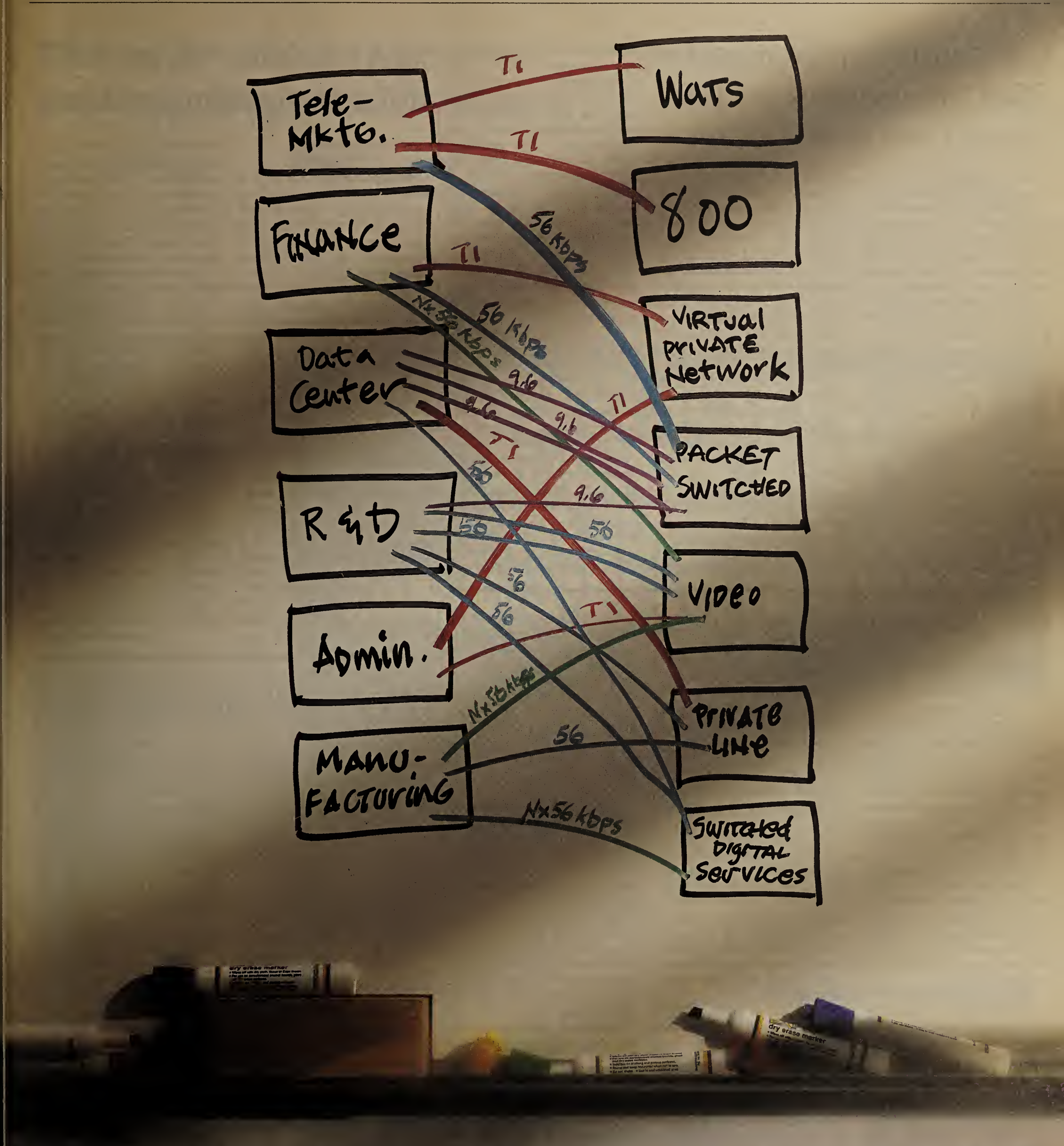

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1989 *Sprint completes PTAT-1, the world's first and largest privately owned transatlantic fiber optic cable.* 1991 *Sprint transmits the first commercial video services to the Soviet Union.*

Competition could dissolve RBHC monopolies by 1999

Conference speakers presage industry shake-up.

By Anita Taff
Washington Bureau Chief

HONOLULU — New wireless technologies that support advanced voice and data services could push policymakers to end Bell company monopolies of the local loop as early as 1999.

This was the opinion of virtually all carriers, regulators and legislators speaking at the U.S. Telephone Association's (USTA) annual conference here last week. If true, this prediction presages what may be an industry shake-up of even greater proportions than the divestiture of AT&T in 1984.

The introduction of competition into the local loop holds the promise of creating more user choices, new services and price competition, but it would require a fundamental restructuring of the local exchange business. Some speakers warned that competition could ultimately result in higher prices and poorer service.

Among the thornier issues that policymakers would have to tackle are: how competition would affect local service and access rates; how to eliminate subsidies that were not completely removed at divestiture between local and long-distance service as well as urban and rural areas; and how to sort out state vs. federal jurisdiction.

The mood at the USTA conference was a sharp contrast to industry pronouncements of only one or two years ago, when the mention of local competition often elicited chuckles or heated denials.

But today, the major local carriers say progress in new wireless technologies, such as personal communications nets (PCN), and bypass carriers with fiber-optic networks have forced them to admit that their control of the local loop is eroding.

William Weiss, chairman and chief executive officer of Ameritech, told USTA attendees that with the dawning of such new technologies, an inexorable march has started toward full competition for local services.

"Competition in the local exchange can't be stopped any more than technology can," he said. Although the major local carriers have been reluctant to accept this idea, Weiss warned other local carriers to learn from history and not bury their heads in the sand.

"The Bell system chose to oppose — adamantly — the introduction of competition," Weiss said. "If we resist as the Bell system did, we can expect rules to emerge that are not reasonable, not economically sound, not fair and probably punitive.

"Either we will resist competition unsuccessfully and be disadvantaged for the effort, or we will acknowledge its inevitability and help define the entry rules," Weiss said.

Robert Pepper, chief of the Of-

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AT&T to offer direct CCS7 links to signaling network

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — In a move that could simplify the management of network services, AT&T is preparing to offer users direct Common Channel Signaling System 7 (CCS7) links into its signaling net.

Direct access into the CCS7 network from a customer site could give users more flexibility in monitoring and managing traffic flow, as well as new routing options for automatic call distribution (ACD) networks and disaster recovery, analysts said.

The interface will reside on a host processor at the user's site. AT&T said it is now providing equipment makers with a specification to guide them in developing interfaces for their equipment but declined to offer further details about the specification or the cost of CCS7 linkage for a user. AT&T could support interconnection as early as next year.

"The ability to send commands to AT&T signal transfer points will allow for greater control and management of networks and enable call routing on a more sophisticated basis than is possible now," said Ian Angus, president of Angus TeleManagement Group, Inc., a Pickering, Ontario, consultancy specializing in Integrated Services Digital Networks and intelligent nets.

Large users, such as American Express Travel Related Services Co. (TRS), have been pressing carriers to offer direct CCS7 links to their signaling nets ("American Express drafts CCS7 plan with carriers," *NW,* June 3).

"There is very definite customer demand for it. We've been in touch with a number of customers that are interested in this type of service," said an AT&T spokesman, who declined to identify the customers.

"Those links would speed call setup to the point where long-distance calls could be set up as quickly as local calls," said Daniel Gonos, telecommunications manager for Domino's Pizza, Inc. in Ann Arbor, Mich.

MCI Communications Corp. has already linked six of its larg-

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OSI management groups to hash out net differences

By Ellen Messmer
Washington Correspondent

GAITHERSBURG, Md. — The future of OSI network management is on the line as the National Institute of Standards and Technology (NIST) and the Network Management (NM) Forum meet here this week to try to iron out their differences.

Both the NM Forum and NIST acknowledge that the meeting will likely be their last chance to align their different approaches to Open Systems Interconnection net management if the specifications are to meet their June 1992 target release dates.

If NIST and the NM Forum cannot harmonize their efforts, the industry will be compelled to implement both versions, dimming the chances for interoperable OSI-based network management systems.

The NM Forum, which is planning to upgrade Version 1.0 of its network management specifications to what it calls the Open Management Interoperability Points (OMNIPoints) Release 1 of the Open Management Roadmap ("Net mgmt. forum eyes single blueprint," *NW,* Sept. 2), will meet with NIST this week to try to persuade it to become an OMNIPoint partner.

NIST officials, preparing to release the Government Network Management Profile (GNMP) in June, said they are open to the idea but are unclear on what OMNIPoint 1 will actually contain and what partnership with the NM Forum entails.

OMNIPoint 1 and GNMP are network management profiles based on the OSI Common Management Information Services (CMIS) and Common Management Information Protocol (CMIP). CMIS describes services that OSI net management systems should provide, and CMIP defines the protocol used to exchange data between net management systems.

NIST and the NM Forum acknowledge that cooperation will benefit both users and vendors, while discord would have a serious negative impact.

"The idea of having multiple competing specs is bad news for vendors and customers," said Keith Willetts, general manager for network management systems and services at British Telecommunications PLC (BT). Willetts, also NM Forum chairman of the board, last week offered remarks from both vantage points.

BT plans an upgrade to its Concert network management system in the spring, soon after OMNIPoint 1 debuts. But if the GNMP and OMNIPoint issues are not resolved, BT will have to build one product for the U.S. government market and another for the commercial market. The result, he said, will be higher costs, which must ultimately be borne by users.

Like BT, Gandalf Data, Ltd. is also planning to bring out a new net management system in the spring. Bruce Cochrane, network management systems architect at Gandalf, said the company will probably implement the earlier NM Forum Version 1.0 specification but could shift gears based on how OMNIPoint 1 is finalized. Cochrane said the prospect of having to decide on yet a third choice — GNMP — was dismaying.

Although future releases of GNMP and OMNIPoint are likely to be similar, differences remain in how GNMP and OMNIPoint have defined their object description of network devices. Objects of devices, applications or services are defined in a database for later retrieval by the network management system.

Although some ISO and IEEE standards include object descriptions, the general procedure of standardizing objects is still evolving, and the NM Forum and NIST have been forced to fill in the gaps.

"The real danger is having object explosion. Someone has to do object policing," Willetts said.

Willetts, speaking for the NM Forum, pointed out that the group would prefer not to have the job and would like to see an official standards body take over.

Fran Nielsen, head of the network management group at NIST, said her organization would come to the meeting with an open mind. "But NIST does not intend to rubber-stamp a forum specification," she said. "I'm positive about the Roadmap activity. The idea is to get industry, government and users together on the same road for network management."

Firms call for single spec

WASHINGTON, D.C. — Vendors are urging the National Institute of Standards and Technology (NIST) and the Network Management (NM) Forum to merge their Open Systems Interconnection net management profiles in an effort to ensure product interoperability.

A dozen major systems vendors have petitioned NIST to align its Government Network Management Profile (GNMP) with the NM Forum's Open Management Interoperability Points (OMNIPoints) Release 1 specification so they will not be forced to build separate products for government and commercial users.

By merging the specifications, vendors could minimize development costs and offer users interoperability among different net management systems, according to Keith Willetts, general manager for network management systems and services at British Telecommunications PLC and NM Forum chairman.

"The forum is willing to compromise," Willetts said.

Officials from NIST and the NM Forum plan to meet this week and said they will make every effort to reach an accord (see "OSI management groups to hash out net differences," this page). Both sides point out that the differences in the object descriptions in GNMP and OMNIPoints will be the toughest issue to resolve.

Object descriptions are specifications that define network devices, applications or services so information on them can be retrieved through the network management system. One reason they are a delicate issue is any changes to OMNIPoints objects would have to be approved by the International Standards Organization.

"Total merging is probably not realistic," said Dan Walters, manager of IBM's network management carrier support department.

Vendors could be forced to support different sets of object definitions, which could make interoperability challenging.

Both GNMP and OMINPoints 1 are targeted for release in June. About a year later, GNMP will become a government mandatory purchasing requirement for net management systems.

DHL Worldwide Express, Inc. called the alignment of GNMP and OMNIPoints a critical issue. "Failure to achieve consensus on this point would be a major setback in the development of multivendor network management," said John Payne, communications architect at DHL.

— Ellen Messmer

Software gives LAN users access to broad range of corporate databases

By Joanne Cummings
Staff Writer

SANTA CLARA, Calif. — Cross Access Corp. is expected to introduce today software that enables LAN-based users to access data from relational and nonrelational database management systems on an enterprise network.

The product, called Cross.Access, eventually will enable a client workstation on a local-area network to communicate with as many as 14 different DBMSs in either IBM Systems Network Architecture or Transmission Control Protocol/Internet Protocol environments.

Initially, the firm will not support LAN-attached workstations as clients. Instead, it will ship Cross.Access with client/server modules to support databases in IBM mainframe or Digital Equipment Corp. VAX/VMS environments. That means an IBM MVS mainframe can act as a client to request information from a DBMS server in another mainframe environment.

Cross.Access supports IBM's Information Warehouse strategy and is the first offering in the Data Delivery portion of that framework to be fully compliant with Systems Application Architecture (SAA) and to support TCP/IP.

Cross.Access consists of a series of client/server software modules. The modules are designed to run on IBM MVS/XA, MVS/ESA, VM/XA, VM/ESA and CICS systems as well as DEC VAX/VMS processors, which may act as the client or server.

The company plans to roll out the software for other platforms over the next year or so, including client support for Unix, OS/2, Apple Computer, Inc. Macintosh and Microsoft Corp. Windows workstations. The package currently supports IBM's DB2, IMS and VSAM DBMSs; the other 11 DBMSs will be supported by the first quarter of next year, Cross Access said.

The product includes several modules. On the client side, an Applications Compiler accepts a user request written in C or COBOL and translates it into an SAA-compliant DB2 SQL statement. It then passes the request to a Client Processor software module. The Client Processor establishes a session with a Server Processor module.

Residing on the server, the Server Processor controls the communications with the client via LU 6.2 or TCP/IP.

The Server Processor uses a system table of the target databases to determine which Data Management System Interface

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Network outage woes continue for Big Three

By Anita Taff
and Bob Wallace
Network World Staff

BLACKSTONE, Mass. — The Big Three carriers suffered network outages last week, heightening user concerns about network availability and virtually guaranteeing a strong response from lawmakers on Capitol Hill.

AT&T suffered its third outage of the year — this one in New England — when routine maintenance went awry and crippled two of three T-3 Digital Access and Cross-Connect Systems (DACS) in a switching center here, blocking 60% of the calls to and from the region for several hours last Tuesday.

The partial loss of the two T-3 DACS had an especially devastating effect on call completion and private-line service because it is the only such AT&T switching center in the six-state region. The DACS are used to switch 1.544M bit/sec T-1 channels among T-3 trunks, providing for network reconfiguration.

"I can understand problems with the intelligent network, which is in an embryonic stage of development, but problems with network layout that create a situation where an entire region is vulnerable to the loss of a single [DACS] center are inexcusable," said Daniel Briere, president of TeleChoice, Inc., a Montclair, N.J., consultancy.

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Corrections: A Worth Noting item (*NW,* Oct. 28) inaccurately described Circle K Corp.'s monthly AT&T Software-Defined Network bill. The original bill weighs in at up to 80 pounds, but an AT&T account team reduces it to a handful of pages. It also misspelled the name of Harry Heintz, Circle K's manager of communications services.

The story titled "Vector's E-mail directory service piques user interest," (*NW,* Oct. 28) incorrectly stated that the service has been endorsed by the American Petroleum Institute's electronic mail committee. The group is piloting the service but is not allowed to endorse any firm or product.

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Ingres DBMS enhancement to increase net performance

Will use alerting to reduce network overhead.

By Caryn Gillooly
Senior Editor

BURLINGAME, Calif. — Ingres Corp. this week is expected to unveil a version of its relational database management system enhanced to support a larger number of clients and applications.

According to sources, Version 6.4 of the Ingres Intelligent Database will run on as many as 30 different versions of Unix, as well as OS/2 and Digital Equipment Corp. VMS-based systems.

Although this level of support is neither new to the product nor unique among DBMSs, what is rare is that the company is expected to promise to port the product to all of those environments within three months of the initial release.

"It's significant that Ingres will deliver [this] for all platforms at essentially the same time," said Tony Percy, vice-president of software management strategies at Gartner Group, Inc., based in Stamford, Conn.

Customers will be able to deploy the same version of the DBMS across multiple platforms in their networks simultaneously, instead of upgrading the network piecemeal.

"In many cases, there's a lag [of up to a year] before the product is ported to other Unix platforms," Percy said. "Ingres said they will port this [to all the stated platforms] within three months."

Of the product's new capabilities, the primary enhancement will be the addition of alerters, according to Aaron Zornes, vice-president of application development strategies at the META Group, a research firm in Westport, Conn.

Customers will be able to deploy the same version of the DBMS across multiple platforms in their networks simultaneously.

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According to Zornes, many applications must continuously query the database to see if their requests have been granted. This, however, can put a heavy traffic load on the net and often be a factor in limiting network size or the type of application that can be employed.

"Imagine 100 traders or 100 brokers all asking [the database] at the same time, is [my request] done yet?" he said.

He explained that with the alerters included in Version 6.4, when an event takes place in the data, the database will automatically send an alert saying the request has been completed.

"This affects the number of clients [that can be supported] on the network," Zornes said. The reason for this is that traffic will be decreased, and the network will then be able to support more clients.

"It [also] lets you have more [remote procedure call] or message-oriented applications on the network," he said, adding that the database and the network will both be able to handle the additional traffic.

Ingres will also announce a Microsoft Corp. Windows-based application development tool that will let software developers create database applications using a Windows-based environment. Previously, Ingres only offered tools that would let developers create applications in Motif and DEC's DECWindows environments.

Finally, Ingres is expected to announce that the IMS Gateway it introduced about a year ago is now available. This will let SQL requests be passed between the Ingres DBMS and IBM's IMS hierarchical database.

Because the Ingres database is relational and the IBM database is hierarchical, this type of exchange is ordinarily "an unnatural act," Percy said. Other vendors have attempted similar connectvity but without success.

HP consulting service aids open systems migration

By Wayne Eckerson
Senior Editor

CUPERTINO, Calif. — Hewlett-Packard Co. is expected to announce today a consulting service designed to help major users draft an open systems architecture and migration plan for implementing open systems.

HP's Open Software Environment (OSE) was rolled out in Europe last March to help HP customers there sort through a variety of issues, such as selecting application program interface (API) standards and open systems products.

Since then, HP has trained internal consultants in the U.S. and the Far East to provide OSE services. The company has also offered the program to 10 beta customers in the U.S., including Owens-Corning Fiberglas Corp. (see "Owens-Corning tags HP for design," page 72).

A number of software vendors have endorsed OSE, including Information Builders, Inc., Informix Software, Inc., Oracle Corp., Software AG and Sybase, Inc.

Laura Cory, director of marketing at HP, said the OSE program is geared to large companies that are committed to open systems but have struggled to implement client/server or cooperative processing applications in a multivendor environment.

The OSE program is geared to large companies committed to open systems.

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While analysts were encouraged by the service, saying it addresses an area of particular concern to large users, they questioned whether a vendor could be truly objective when recommending products.

The core of the OSE program is a two-day, $20,000 workshop in which HP's OSE consultants work with a company to assess its current information technology environment and draft an open systems architecture tailored to its business needs. The workshop helps the client select a suite of standard APIs and products, as well as develop a plan for moving through the prototype, pilot and production phases of the project.

HP will also work with clients after the workshop to steer the implementation process and provide technical advice. Pre- and post-workshop fees are negotiated separately.

As part of OSE, HP has developed a 200-page reference guide that assesses all standard APIs based on the breadth of implementation and the degree of interoperability each affords with other systems components. HP clients select APIs that best connect various components in their open systems architecture.

HP also has developed a series of implementation guidelines that are essentially case studies

(continued on page 72)

Plans may herald NOS shift

continued from page 1

Building these functions directly into Windows demonstrates that, in the long term, Microsoft's network strategy will be based solely on Windows, a fact that could prompt Microsoft and other local-area network vendors to steer clear of traditional net operating systems in favor of Windows-based network services.

"It's not going to remain LAN Manager vs. NetWare," said Dave Marshak, senior consultant at Patricia Seybold's Office Computing Group in Boston. "Microsoft's general direction is clear. What's not clear yet is whether LAN Manager will stay or be submerged in the Windows strategy."

Recasting network components in distinct client, server and distributed network service offerings would make it possible for Microsoft to build a model in which the client and server pieces would not have to be produced by the same vendor.

"This will be an evolutionary, not a revolutionary move," explained Craig Burton, chief executive officer of Clarke Burton Corp. in Salt Lake City. "This shift isn't just a technological change; this involves the whole industry rethinking the infrastructure of networking as we now know it."

From the client side, Microsoft is positioning Windows as a way to build a "universal client architecture" that enables Windows clients to access a range of servers. This capability is currently provided through LAN Manager, not through Windows.

Both clients and servers will then be outfitted with portions of LAN Manager functionality and a new suite of distributed services, such as directories, authentication, naming and network management.

Besides these network options, customers will also be able to link Windows clients and servers using network services from third parties that were developed to Win32, a common application program interface (API) for DOS, Windows and Windows NT.

With most major software vendors already writing to Windows, it is clear Microsoft could thus slowly begin to position itself as a significant network player by moving the playing field down at the operating system level.

Changing stakes

While no vendor is expected to challenge Novell, Inc.'s NetWare at the level of basic network file and print services, this strategy could enable Microsoft to force Novell to offer NetWare services for Windows-based environments.

"Today, the networking marketplace is defined by Novell, but I don't think it's the best way to do networking from a user's perspective," said Jim Allchin, vice-president of advanced services at Microsoft and an architect of Banyan's VINES network operating system.

Allchin maintains that the network should become invisible to the user and that today's file and print server network operating systems are still far too difficult to use, especially in terms of multivendor interoperability.

He said current LAN offerings are missing key components to support distributed applications and need to compensate too much for operating systems that were not optimized for networking. Because Windows NT is being designed up-front for networking, Allchin said that the introduction of open network services will blur what the user sees as the differences between the client and server components.

Allchin said that it has been possible to take existing network functionality and make it faster, more integrated, more secure and easier to maintain by building it into the 32-bit Windows NT operating system.

For example, in the area of fault tolerance — a sore point for most LAN vendors — he said Microsoft has been able to design a layered driver in Windows NT that will automatically pick up file transactions on the net.

According to Allchin, LAN Manager is not going away, but is evolving into a broader network strategy. He said the packaging of LAN Manager is not what's important because it is too early to say how integrated certain functions will be faring by next year. He did say, however, that when Windows NT comes out, it will be compatible with LAN Manager and then, at a later date, the advanced services are expected to arrive and add even more network capabilities.

By combining Windows, Windows NT, advanced services and LAN Manager into a unified front, Microsoft is pinning its network hopes through the mid-1990s on maintaining control of the desktop, stimulating the development of distributed network applications around its Windows API and building transparency between the desktop and the set of network services.

"We have no hidden agenda," said Mike Murray, general manager of the Network Business unit at Microsoft. "With a Windows desktop and Windows NT, there is going to be tight synergy in networking."

Murray said Microsoft will work with Novell and Banyan to provide extensive Windows support for their network operating systems, but it will never be possible to get the same level of intimacy with those systems as when a Windows client is coupled with a Windows NT server.

"We'll provide that functionality here before we do it for third parties," he said.

NetWare reworked to address limitations

continued from page 2

Jamie Lewis, vice-president at Clarke Burton Corp., a consulting firm in Salt Lake City.

The design limitations of IPX and NetWare Core Protocol are often not noticeable over a short distance, such as on an Ethernet LAN. However, because of the long distance and slower bandwidth of wide-area lines, the limitations become more pronounced. "They're inefficient when you try to use them over a [WAN]," Lewis said.

NetWare users point to NetWare Core Protocol's request/reply mode operation as one of the reasons for NetWare's slow performance. When a packet is transmitted across the net under that configuration, the sending node must wait for an acknowledgement from a receiving node before sending the next packet.

Another factor limiting performance is that Novell's IPX transport protocol specifies that data be sent in small packets of only 512 bytes each. Most other protocols specify packets of at least twice that size.

"[Wide-area] file copying with NetWare is like Ping-Pong," said Jim Baldridge, network manager at HealthCare Compare/Affordable, a health care cost management company based in Downers Grove, Ill. "IPX as a packet delivery system is efficient, but if you need to transfer files, it's inefficient.

"It would be nice to have larger packet sizes, and it would be nice if NetWare could support file transfer that did not require an echo," Baldridge added. That is what Novell plans to do.

Sources said the company is working on a Packet Burst IPX mode. The new technology will be implemented in two parts: a Packet Burst NetWare Loadable Module that will run on a NetWare 3.11 server, and a new IPX module implemented in a new client workstation shell.

To solve the small packet-size problem, Novell will change the protocols to support larger size packets, although sources did not know for certain how large the packets would be. The company plans to remedy the request/reply mode problem by altering the NetWare Core Protocols to send a string of packets and subsequently wait for a confirmation from the receiving node after a short data burst.

According to Jim Forster, manager of software engineering at Cisco Systems, Inc., the company has tested its routers with the new technology.

"We tested it on a LAN-to-LAN basis — not on a [WAN] — and measured a speed increase of about 25%," Forster said. "Taking that into account, we estimate that on [WANs], things would speed up from 500% to 1,000%."

Novell's Edwards said the technology is currently being tested at various customer sites. He added that the company plans to roll out products with the new technology in the first half of next year.

After the initial release, analysts predict that Novell will bundle the features in NetWare Version 3.2, slated for availability in the second half of next year. ◼

AT&T to offer direct CCS7 links

continued from page 4

est customers to its CCS7 network, offering the linkage on an individual basis, rather than as a general tariff. US Sprint Communications Co. has been discussing such an undertaking with some of its largest customers for several months but has not decided when it will give users access to its signaling net or how it will recoup the linkage costs.

"We intend to do the same as AT&T," said Rick Coleman, US Sprint's assistant vice-president of technology management. "This would enable users to perform real-time routing faster than using advanced 800 routing features."

Analysts said the CCS7 links will add a new dimension to intelligent networking.

One use for direct CCS7 links into a carrier's signaling network would be to build an ACD net that takes advantage of routing intelligence in public networks to flexibly handle incoming calls. American Express TRS is working with carriers to implement such an application.

With a direct link to a carrier's signaling network, the switch at the originating end would hold each toll-free call while checking a database at an AT&T STP to determine the call's destination. The STP would then pass the signaling information over an X.25 link to a host processor at a customer call center serving as an STP.

If the call center is overloaded, the STP would instruct the carrier to route the call to another site.

Analysts say users stand to realize substantial trunking efficiencies by using direct CCS7 links to signaling networks.

"Instead of rerouting calls over expensive lines to a center with available agents, the user's STP can tell the carrier's [STP] where to send the calls," said Daniel Briere, president of TeleChoice, Inc., a Montclair, N.J., consultancy. "By eliminating trunks, the break-even [point] for this kind of project could be fairly low."

Although mounting user demand for signaling network links is enticing, analysts said carriers must first ensure the security of their signaling systems.

"STP vendors offer gateway screening software that can prevent, for example, a user's STP from instructing a carrier's STP to pass error messages to other devices or to shut down," Briere said. ◼

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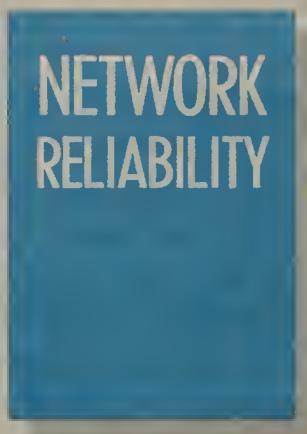

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

The computer software and services trade organization Adapso recently took on a new name, the Information Technology Association of America, to reflect the role of its members beyond automated data processing, the group's earlier focus.

People & Positions

Network Equipment Technologies, Inc. recently appointed **DuWayne Peterson** to its board of directors.

Peterson is president of DuWayne Peterson & Associates, a telecommunications consulting firm in Pasadena, Calif. Previously, he was executive vice-president of operations/systems and telecommunications at Merrill Lynch & Company, Inc.

3Com Corp. recently announced that **Andy Verhalen,** vice-president and general manager of its Network Adapter Division, has resigned effective Nov. 1 to join a start-up firm yet to be determined.

Compaq Computer Corp.'s board of directors recently ousted **Rod Canion,** the company's president and chief executive officer, over strategic differences and replaced him with **Eckhard Pfeiffer.**

Previously, Pfeiffer was Compaq's executive vice-president and chief operating officer responsible for all day-to-day operational functions, including marketing, sales and manufacturing. He will retain those responsibilities.

The management change came on the heels of an announced restructuring at Compaq to cut its work force by 12%. Restructuring charges were put at $135 million and contributed to a $70 million loss by Compaq in the third quarter ended Sept. 30. ◻

Trade groups denounce bill to alter gov't procurement

Users speak out about FTS 2000 rule changes.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — At a recent House Government Operations subcommittee hearing, information technology trade groups sharply criticized a bill designed to overhaul the government's procurement process.

The trade groups applauded H.R. 3161, The Federal Property and Administrative Services Authorization Act of 1991, for boosting purchase of off-the-shelf products and eliminating paperwork. However, they attacked restrictions on Federal Telecommunications System (FTS) 2000 along with another provision intended to make it tougher for agencies to add products to existing contracts through modifications.

"The ability to perform technological refinements during the life of a contract is an indispensable tool of contract management and administration," said Dan Heinemeier, vice-president of the government division at the Electronic Industry Association (EIA), during the hearing.

Heinemeier said the commercial and government sectors practice contract modification to implement technological advances and product refinements without canceling the underlying contract.

Heinemeier called the new restrictions under the bill "unreasonable."

John McIver, the government procurement committee chairman of the Computer and Business Equipment Manufacturers Association (CBEMA), said the bill would preclude an agency contracting officer from instituting any contract change unless the officer solicits new bids or proposes an addition to the contract.

Also, contracting officers would have to submit written justifications for any exemptions to the House Government Operations Committe and the Senate Governmental Affairs Committee.

According to McIver, contract modifications are widely used in government contracting circles to take advantage of new pricing and technological advancement. He also said the the bill's contract modification provision "adds complexity to the process and imposes congressional scrutiny."

Luanne James, president of Adapso — which last week changed its name to the Information Technology Association of America (ITAA) — told Congress the group's members were deeply concerned about the contract modification clause.

(continued on page 10)

INDUSTRY BRIEFS

United Telecom to resell PictureTel gear. United Telecommunications, Inc. last week said it will resell PictureTel Corp.'s line of videoconferencing products through its seven local operating companies.

The PictureTel products complement United Telecom's high-speed digital network services, said Tom Farmer, vice-president of marketing at United Telecom. That company also said it will support its North Supply business unit in establishing a national distribution network for PictureTel equipment. PictureTel's newly established nationwide dealer network is being managed exclusively by North Supply.

New consulting firm formed. Industry consultant Nick Lippis last week announced the formation of a new consulting firm called Strategic Network Consulting, Inc.

The company, which is based in Rockland, Mass., will focus on network computing and management issues. The company will provide both user and vendor consulting services ranging from market research to architectural development. The firm also plans to issue newsletters and multiclient reports on the industry.

Lippis, a principal with Strategic Network Consulting, previously was a principal at Northeast Consulting Resources, Inc. in Boston. For more information, call Strategic Network Consulting at (617) 871-5195. ◻

Apple connectivity through the years

1985	Adobe Systems, Inc. and other printer companies begin including Apple Computer, Inc.'s AppleTalk in their printers.
1986	Third-party companies start releasing LocalTalk-to-LocalTalk bridges and routers.
1987	E-mail packages using AppleTalk protocols emerge. The first AppleTalk-to-Ethernet products become available.
1988	Digital Equipment Corp. is the first to offer AppleShare file services on its own hardware.
1989	Novell, Inc. releases NetWare for Macintosh.
1990	Apple initiates AppleTalk licensing program.
1991	Banyan Systems, Inc., IBM, Microsoft Corp., Novell and others license AppleTalk protocols.

GRAPHIC BY TERRI MITCHELL

Vendors heed users' calls for Mac support

IBM, Banyan, Microsoft among firms to license AppleTalk to provide direct client support for Macs.

By Caryn Gillooly
Senior Editor

Network operating system suppliers, including large system suppliers such as IBM, are succumbing to pressure from users to bundle Macintosh workstation support directly into their local-area network server software products.

Within the past few months, such industry heavyweights as IBM, Banyan Systems, Inc. and Microsoft Corp. have announced agreements to license Apple Computer, Inc.'s AppleTalk protocols and build support for the protocol directly into their software offerings.

This will enable a Macintosh to operate as a client on a peer basis with other nodes on the LAN, giving the Macintosh access to the same data and services as DOS, OS/2 and, in some cases, Unix workstations.

"We believe AppleTalk is being accepted industrywide as a simple low-cost protocol," said Ellen Hancock, IBM vice-president and general manager of networking systems, during a briefing on the Apple-IBM relationship at the recent NetWorld 91 Dallas show. "Our customers have certainly asked us to support it."

Although the IBM, Banyan and Microsoft deals to license AppleTalk are the most recent, Apple has signed on more than 40 vendors to license AppleTalk since it began its AppleTalk Licensing Program in June 1990.

But analysts said the adoption of AppleTalk by IBM could ensure the protocol's long-term viability in user nets and identify it as a strategic protocol for users and vendors alike.

"IBM doing this is huge; they always maintained IBM doesn't link to other environments," said Lee Doyle, an analyst at International Data Corp., a Framingham, Mass., research and consulting firm. "It's significant that IBM's finally signed on."

Vendors and analysts agree there are several reasons for the increasing Macintosh interest. The most relevant is the growing number of Macintosh clients in corporate accounts and the increasing need to connect those Macintoshes and Macintosh-based networks into the enterprise net.

"Macintoshes are more popular now than OS/2 and Unix [as a desktop platform]," Doyle said. "In terms of market share, Macintoshes represent at least one in 10 [machines] in desktop environments and up to one-fifth of all networked personal computers. Macintoshes are not going away."

Other analysts agreed.

"Users are demanding the ability to connect the Macintosh into the corporate net," said Todd Dagres, director of data communications research and consulting at The Yankee Group in Boston.

Dagres gave an example of one client that had implemented a policy not to put AppleTalk on the corporate backbone. "He said it was not the type of protocol he wanted [there]," Dagres said.

Since then, according to Dagres, the client has changed his policy and now has AppleTalk

(continued on page 10)

Vendors heed users' calls for Mac support

continued from page 9

running on the corporate backbone. "Users demanded it," he said.

Ed Daniels, IBM's system manager for enterprise LAN communications at IBM, told of one customer that chose to implement Macintoshes in a large segment of the organization. "The customer didn't realize at the time he would need to access the rest of the [corporate] environment," Daniels said. "Since then, we've gotten a lot of pressure from this customer and others to tie the Macintoshes into NetView" and provide better overall connectivity.

Users are demanding Macintosh client support from systems and network software suppliers in order to provide functionality they can't get from third-party bridge or gateway products, analysts said.

"In the early years, Pacer [Software, Inc.] and Alisa [Systems, Inc.] were making a lot of money selling server capabilities and file server protocols to run on alternative platforms," said Kevin O'Neill, vice-president of network research and consulting at Business Research Group in Newton, Mass. "But now, as internetworking becomes mandatory, users are demanding [Macintosh connectivity] from their primary vendors. If vendors can't integrate Macintoshes, they lose business."

According to Pam Campagna, product manager of client products at Banyan, with previous versions of VINES, Macintosh users could connect to a VINES server via a third-party gateway, but those users could not take advantage of many of the inherent features of VINES.

"[The gateway] was an acceptable short-term solution, but [those clients could not] take advantage of [Banyan's] StreetTalk or security, or share files with all Banyan customers," Campagna said. "Customers wanted [integrated] Macintosh support, and that meant supporting the Apple Filing Protocol and the Printing Access Protocol" as well as the entire AppleTalk protocol stack.

According to analysts, users also wanted the connectivity from their primary vendors for support purposes.

"Users would prefer to buy key components from their larger vendors," O'Neill said. "Users loathe dealing with multiple vendors; it just leads to finger pointing if there's a problem."

Users view the spate of AppleTalk licensing deals as a healthy sign of progress.

"These agreements certainly help us," said Roger Bundy, manager of system services at Taco Bell Corp. in Irvine, Calif. Taco Bell has 350 Macintoshes, 350 IBM workstations and 12 regional offices all on a token-ring backbone.

"Everything we buy now are Macintoshes, but we still have an IBM base and that's not going away," Bundy said. "Before all this, we used 'sneakerware' to connect everything."

Groups denounce bill to alter procurement

continued from page 9

"We understand it was the committee's intent to bring 'sunshine' to the contract modification process," James said. "It is our view, however, [that] this provision as now written would greatly increase the paperwork burdens for contracting officers and drastically raise the government's procurement costs."

Although Rep. John Conyers Jr. (D-Mich.), committee chairman and author of the bill, promised to give careful attention to the industry views, he said he found the modication of the contract system to be "death on the whole idea of competition."

However, H.R. 3161, which contains a provision mandating use of FTS 2000 for federal agencies (see graphic, this page), excludes FTS 2000 from the same contract modification rules as other government purchases.

James told Conyers, "We see no reason to exempt the FTS 2000 contracts from the requirements of the 'substantial modifications' of the bill. This confers unwarranted and, to our knowledge, unjustified special treatment of the FTS 2000 contracts."

Surprisingly, Conyers agreed. "I don't either. It was an accident," he said, implying that the provision had inadvertently crept into the bill.

CBEMA, IITAA, EIA and the Computer and Communications Industry Association (CCIA) testified in support of the concept of mandating FTS 2000 for federal agencies. However, they objected to specific language in the bill.

The bill specifically forbids the General Services Administration from exempting any agency from using FTS 2000. It makes no mention of the so-called Warner amendment, which has given the armed forces broad leeway in their procurement actions.

The provision on FTS 2000 also states that products should be purchased under the deal. However, FTS 2000, as awarded, is a contract for services only, not telecommunications products, James said.

On behalf of CBEMA, McIver recommended that all references to product acquisitions be deleted. He also said the GSA should not be limited in its authority to grant waivers.

Speaking for EIA, Heinemeier noted that the provision on FTS 2000 "goes significantly beyond current law and its real effect would be unknown."

The trade groups also criticized the definition for "commercial products" in H.R. 3161, stating that because it only defines products sold in the marketplace, it would exclude vendors' more advanced technologies.

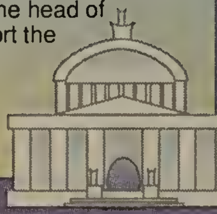
They also objected to the bill's requirement that pricing must represent no less than 30% of all evaluation factors in a contract's award.

"Price should always be a factor," McIver said. "But the weight of that factor, especially in high-technology procurements, where quality, past experience and technical superiority may be key factors, should be left to the discretion of contracting officials."

Key provisions of H.R. 3161

The Federal Property and Administrative Services Authorization Act of 1991

- Strips the GSA of its procurement authorization and subjects the administration to an annual congressional budget review.
- Places tighter restrictions on agencies conducting contract modifications with vendors.
- Requires all agencies to use FTS 2000 for any covered service and product, and emphasizes that the GSA is not allowed to authorize agencies to do otherwise. FTS 2000 is also declared exempt from the contract modification rule.
- Requires agencies to implement a preference for buying commercially available items whenever possible.
- Instructs the GSA to collect from agencies all information regarding the procurement of ADP equipment. If the head of an agency fails to report the data, the GSA must suspend the agency's authority to lease and purchase ADP equipment.



ADP = Automatic data processing
FTS = Federal Telecommunications System

GRAPHIC BY TERRI MITCHELL

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Novell redraws corporate lines, modifies focus

By Bob Brown
Senior Editor

PROVO, Utah — Novell, Inc. last week said it has reorganized its operations around three primary business groups to respond faster to customer needs.

Novell established the NetWare Systems Group, Interoperability Systems Group and Digital Research Systems Group, each headed by executives reporting to Raymond Noorda, the company's president and chief executive officer.

Previously, the company was organized along more operational lines, such as sales and research and development.

"Novell has taken these steps to maintain its responsiveness to customer needs for an increasing array of software products," Noorda said. "Within this structure, Novell's product units will be able to keep in closer contact with customers, be more flexible in their response and better able to deliver the desired solutions."

A company spokeswoman said the management shuffle was not a move to prepare a successor to Noorda, who has indicated that he is thinking about retirement.

James Bills, previously executive vice-president of sales, was named executive vice-president and general manager of the NetWare Systems Group. He will be responsible for product development and marketing of NetWare, IBM connectivity, Apple Computer, Inc. Macintosh connectivity and database products.

This group will also maintain the Novell Labs Independent Manufacturers Support Program and Software Testing Program, which provide testing and certification of NetWare compatibility for hardware and software products from more than 400 computer product vendors.

Kanwal Rekhi, previously executive vice-president of product development, was named executive vice-president and general manager of the Interoperability Systems Group. This group includes product development and marketing of Unix products, Transmission Control Protocol/Internet Protocol and International Standards Organization-based standards products, messaging products, wide-area network technology and network management product development, including intelligent hub and multiprotocol routing software.

Richard Williams, previously president and CEO of Digital Research, Inc., now a Novell subsidiary, was named executive vice-president of overall product sales as well as general manager of the Digital Research Systems Group. Novell's worldwide sales organization, which supports all three business groups, reports to him.

Charlie Robbins, director of communications research at Aberdeen Group, Inc., a market research firm in Boston, said Novell is getting too big not to have a focused organizational setup. "Novell is becoming a giant company," he said. "It needed to focus a little more."

Of all the moves, the promotion of Williams — who until recently was an outsider — to the head sales position is the most intriguing, Robbins said. "Williams has been given a giant vote of confidence."

TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

The number of Integrated Services Digital Network lines installed by the regional Bell holding companies will rise from 21,767 this year to 61,671 by the end of 1994, according to a report from Frost & Sullivan, Inc., a New York market research firm.

Carrier Watch

Metropolitan Fiber Systems, Inc. (MFS) last week announced it has signed agreements with Nynex Corp. subsidiaries New York Telephone Co. and New England Telephone and Telegraph Co. for central office connections in New York and Boston.

MFS is installing transmission facilities in six New York Telephone central offices and four New England Telephone central offices for interconnection of intrastate special access and limited switched access services.

MFS will physically connect with three New York Telephone central offices in midtown Manhattan, one central office in Brooklyn and two in lower Manhattan. The four New England Telephone central offices are located in downtown Boston.

The agreements will enable businesses not physically located in the path of MFS' fiber-optic networks to access these networks through telephone company central offices.

In addition, MFS will be able to provide New York Telephone and New England Telephone Flexpath customers with a diversely routed transmission facility as an alternative to Nynex's digital transport facility between users' premises switches and the Bell operating companies' central offices.

MFS operates networks in Baltimore, Boston, Chicago, Dallas, Houston, Los Angeles,

(continued on page 14)

Inventor maps legal route around toll-call charges

Uses call forwarding to leapfrog through LATAs.

By Joanne Cummings
Staff Writer

PHILADELPHIA — An inventor from Rochester, N.Y., has discovered a tariff loophole that enables him to place toll calls at local rates by using a personal computer-based call-forwarding system.

Joel Shapiro's Gabriel system can pass calls from one local access and transport area to the next while incurring only local call charges. He said that, in certain situations, Gabriel can save users 80% in monthly toll charges.

> "It's a completely legal way to bypass your long-distance toll carrier."
>
> ▲▲▲

"It's a completely legal way to bypass your long-distance toll carrier," Shapiro explained. Although its application has a limited business appeal, it may prove useful to Centrex customers in certain states.

In fact, Shapiro is seeking companies to test the system by using either a service he has established here or buying the system and setting up a private network.

Gabriel essentially consists of an IBM Personal Computer XT and a voice processing board. The working model he has installed and is now using to provide services offers an example of how the system works.

A local call in Philadelphia, as well as in surrounding suburban areas, costs seven cents, Shapiro said. But calling Philadelphia from certain suburbs costs 15 cents for the first three minutes and 6 cents for each minute thereafter.

Gabriel enables customers to avoid the higher charge.

For example, when using Gabriel, a customer that needs to call Philadelphia from his Norristown, Pa., office — normally a toll charge — can call his home telephone, which is located in a suburb of Philadelphia that has local calling access to the city. His call instructs his home phone to be forwarded to the Gabriel system in Philadelphia using a carrier-provided forwarding service.

(continued on page 14)

WASHINGTON UPDATE

BY ELLEN MESSMER

Bill would establish telecom trust fund. With the goal of building a national fiber-optic network, Rep. Don Ritter (R-Pa.) introduced The National Telecommunications and Infrastructure Act of 1991 to establish a trust fund to provide grants for improving the nation's telecommunications networks and deploying broadband technologies.

Under the bill, contributions to the Department of the Treasury fund would become available through spectrum auctioning, a new competitive bidding process under which the Federal Communications Commission would sell off radio frequencies. The process would not apply to frequency licenses that are up for renewal or those used by government, public radio or television, private radio or other services the FCC decides to exclude from the auctioning process.

The FCC would be instructed to coordinate network planning and set standards among carriers in order to achieve an interoperable broadband telecommunications system nationwide. The National Telecommunications and Information Administration (NTIA) would be authorized to allocate money from the trust fund.

Any project to install fiber optics in the public switched network would be eligible to receive funds from the NTIA, particularly if the project could not be completed based on market forces alone.

(continued on page 15)

States vary on caller ID approach

State	Caller ID in effect with/without blocking required	Legislation requiring blocking approved/ pending	Caller ID tariffs suspended/ appealed
Alabama	Blocking		
California	Blocking	✓	
Delaware	Blocking		
Florida	Blocking		
Indiana	Blocking		
Kentucky	Blocking		
Maryland	Blocking		
Michigan	NA	✓	
Nevada	Blocking		
New Jersey	No blocking	✓	
North Carolina	NA		✓
Ohio	NA		✓
Pennsylvania*	NA	✓	
South Carolina	NA		✓
Tennessee	No blocking		
Vermont	No blocking		
Virginia	No blocking	✓	
Washington, D.C.	Blocking		
West Virginia	No blocking		

*Caller ID ruled illegal by courts.

NA = Not applicable

GRAPHIC BY SUSAN J. CHAMPENY

New moves afoot to limit use of ANI info

State protection board, others question use of caller data gathered with 800 and 900 services.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Proposals under discussion by federal and state officials could significantly limit the ability of corporations to collect and use customer telephone numbers gathered over 800, 900 and regular long-distance lines.

Late last month, the New York State Consumer Protection Board (NYSCPB) launched an effort to suspend portions of federal tariffs that allow corporations to collect calling information from 800 and 900 services. The NYSCPB asked the Federal Communications Commission to restrict the collection of such information to carriers who need it for billing.

The NYSCPB effort is just the latest in a series of attempts to sort out the privacy issues raised by two telephone services that allow recipients of a call to determine the telephone number of the dialing party before the call is answered. One of those services, caller identification, is being offered exclusively on a intra-local access and transport area basis to business and residential users.

Automatic number identification, a slightly different capability provided by long-distance carriers, enables companies with trunk-side connections to 800 or 900 serving switches to collect the originating telephone number of all callers.

Although state regulators have been taking a hard look at privacy issues centered around caller ID for the past several years, the NYSCPB's request to the FCC is the most direct attempt to shut down corporate use of the ANI capabilities of 800 and 900 services.

In a letter to the FCC, the NYSCPB said a survey of customers in the New York area indicated that 80% of telephone subscribers are concerned that services like caller ID will lead to unsolicited telemarketing calls. In the same survey, 70% of customers said they were concerned that their phone number would be revealed to someone who purchases caller ID.

> The NYSCPB effort is just the latest in a series of attempts to sort out privacy issues.
>
> ▲▲▲

In order to prevent possible abuses, the NYSCPB asked the FCC to force carriers to stop supplying ANI to corporations until federal rules can be put in place to protect callers' privacy. In late September, the FCC proposed a set of rules for interstate ANI and caller ID that would mandate that users have the option of blocking

(continued on page 15)

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Carrier Watch

continued from page 11

Minneapolis, New York, Philadelphia, Pittsburgh, San Francisco and Washington, D.C.

Southwestern Bell Telephone Co. last week announced it has received interim approval for an offering called Digital Loop Service, which would give users a digital link between private branch exchanges and the telephone company's central offices.

With the service, users can connect their PBXs at T-1 speeds to a Southwestern Bell central office. Currently, users buy analog trunks for their digital PBXs. This requires users to buy analog line cards, which are far more expensive than their digital equivalents, for their PBX.

"Today, it takes three analog line cards to handle 24 trunks," said Mike Reddout, Southwestern Bell's Digital Loop Service product manager. "When customers buy Digital Loop Service, they only need one DS1 line card to handle the same 24 trunks."

Southwestern Bell is awaiting final approval from the Public Utilities Commission of Texas.

The carrier already offers digital trunk service in Kansas and Missouri and plans to file tariffs for the service soon in Arkansas and Oklahoma.

Southwestern Bell is a wholly owned subsidiary of Southwestern Bell Corp. and provides service to over nine million customers in its five-state region.

In a separate action, **Southwestern Bell Telephone Co.** last week said that the new 210 area code will serve users in the southern tip of Texas beginning late next year.

Changing from the current 512 area code to the new one on Nov. 1 will be all communities in the San Antonio and Brownsville local access and transport areas, including those served by Southwestern Bell and other local telephone companies.

The change will take place in two stages. For a six-month period, from the start-up date until May 2, 1993, customers who dial the 512 area code to reach telephone numbers in the 210 area code will have their calls automatically switched to the 210 number.

After the adjustment period ends, callers still using 512 when dialing numbers in the new 210 region will hear a recorded message instructing them to dial the correct code.

Illinois Bell Telephone Co. will soon begin using existing telephone lines to perform water meter readings, a move that would eliminate the need for water companies to visit customers locations or estimate customer bills.

The Bell operating company will begin using the new service, dubbed Ameritech's Automatic Meter Reading, in the Chicago suburbs of Bensenville and Niles.

An Illinois Bell spokeswoman said the meter reading service does not interfere with the customer's use of the telephone. If a customer makes or answers a call during the meter reading, the call will override the reading process and be connected normally.

With the service, a utility customer's meter is connected to the customer's phone line through a special reading unit. When the phone is not being used — usually during the middle of the night — equipment in the Illinois Bell switching center can dial the unit and read the meter without ringing the telephone and disturbing customers.

The information is then delivered to the utility's computerized data collection center, also via telephone lines, at no charge

Inventor maps route around toll calls

continued from page 11

When users reach Gabriel, it prompts them to input a personal identification number using their push-button phone and then asks them to input the phone number they wish to call — all for the flat seven-cent rate. The number of local calls adds up, however, and once you pass a certain level of usage, the phone company adds message unit charges, Shapiro said.

Besides routing the call, Gabriel tracks the usage of the system by the various subscribers. Shapiro said he charges subscribers a minimum of $15 per month, plus usage charges if they exceed that figure in monthly local calls.

Although only one phone is forwarded to Gabriel, the line is cleared as soon as the call is forwarded, enabling other calls to be forwarded. If two calls try to reach the forwarding phone at the same time, one will not get through because it takes a fraction of a second to forward the call. "I'm not sure what the performance numbers are for that," Shapiro said.

Companies that use Centrex may be able to use Gabriel by setting up a link of phone company-forwarded phones, each with local calling access to the next phone in line with a final destination of the Gabriel system.

Once accessed, Gabriel would dial the destination number and transfer the call, a process that takes about 15 seconds. Once the call is routed, Gabriel is free to handle other calls. This means the system can accommodate approximately 240 calls per hour when used with Centrex.

Shapiro said his system is available now. Users that want more information can reach him at (716) 987-7498. ◘

V.

The Leader In
High-Speed Modems
Offers Another
Startling
Performance
Figure.

to the customers. The entire process takes less than 10 seconds.

Bensenville, a community of 17,700 residents, is converting all 5,200 residential and business water meters to the new system. Installation of the new system began this month and is expected to be completed by January.

In Niles, a suburb of 30,000, about 900 businesses are being connected to the system. Installation will be completed late next month, the spokeswoman said.

Consumers Illinois Water Co. in Kankakee, Illinois Bell's first paying customer in a market trial of the service in 1989, recently signed a seven-year contract to continue the automatic meter reading of 100 customer meters. ◪

Washington Update

continued from page 11

Reserve disputes FTS 2000. The General Services Administration last week filed comments with the GSA Board of Contract Appeals regarding the dispute between US Sprint Communications Co. and the Federal Reserve System over joining Federal Telecommunications System (FTS) 2000.

US Sprint maintains that the Federal Reserve System, which includes the Federal Reserve Board and 12 member banks, were assigned by the GSA in January 1989 to US Sprint's portion of the FTS 2000 network. The Reserve, which does not want to be declared a government agency subject to federal purchasing rules, has balked at using FTS 2000.

US Sprint has asked the appeals board to rule on the case. In its filing with that board, the GSA stated that it considers the board to be a federal agency, but the 12 banks to be privately owned corporations.

Device to review billing. The General Services Administration awarded Unisys Corp. a $6.1 million contract for the purchase of an Automated Test Call Generator, which will be used to verify billing accuracy for the GSA's Federal Telecommunications System (FTS) 2000 network.

The contract will be for one year, with nine one-year renewable options. ◪

New moves afoot to limit ANI use

continued from page 11

their numbers from being delivered to customers of those services.

Bills in both the U.S. House of Representatives and the Senate would place restrictions on the collection and use of information gathered over the telephone network. However, neither of those bills has moved to the floor for a final vote yet.

Although long-distance carriers have been supplying calling information through ANI to customers for several years, the service became controversial only recently when caller ID, which provides an instantaneous look at the incoming telephone number, became well known to the public.

ANI services have typically only been used to compile a list of callers dialing into an 800 or 900 number at the end of each month. There are some applications in which customers can receive incoming call information from an ANI service in real time, but those have not been as predominant.

The main complaints lodged against caller ID and ANI services is that they force callers to reveal their phone numbers even if they pay a fee each month to keep their numbers from being listed in the local phone book.

> Public complaints have poured into Congress about unsolicited and unwanted calls from telemarketers.
>
> ▲▲▲

Additionally, public complaints have poured into Congress about unsolicited and unwanted calls from telemarketers, who purchase lists of names compiled by companies using ANI from 800 or 900 calls.

A bill introduced by Rep. Edward Markey (D-Mass.) and passed by the Subcommittee on Telecommunications and Finance in August would prevent firms with caller ID or ANI services from using telephone numbers or other personal information gleaned from 800, 900 or local calls for any purpose other than internal use. It would prevent the disclosure of information about characteristics of customer transmission and transmission speeds.

A bill introduced this year by Sen. Herb Kohl (D-Wis.) would require that callers be allowed to block the delivery of their numbers for no charge, but would solidify the legal standing of caller ID and ANI services by preventing states from ruling such services to be illegal.

The FCC's proposal also requests that customers be allowed to block transmission of their caller ID numbers free of charge but concluded that, since ANI is provided with a slightly different technology, it cannot be readily blocked.

ANI traditionally was used to supply long-distance carriers with billing information when local calls were handed off. Because the ANI information is still needed for billing, the FCC said there are technical problems in figuring out when the ANI information could be blocked. ◪

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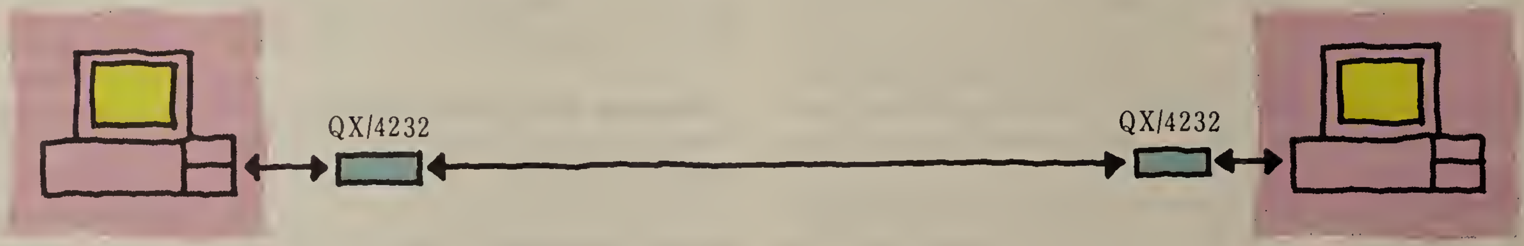

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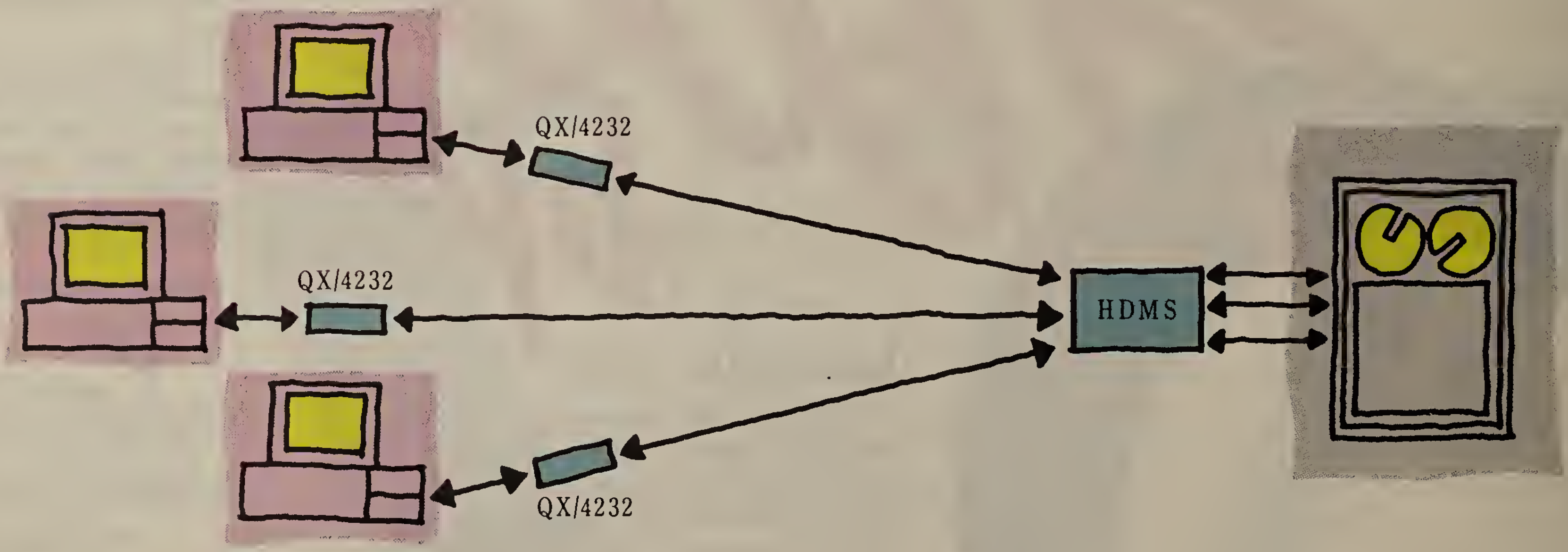

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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

> "The U.S. banking system would probably collapse if a bug were found in [IBM's] LU 6.2."
>
> **Mohsen Al-Ghosein**
> Consultant
> Microsoft Corp.'s
> Consulting Services
> San Francisco

Data Packets

Network Software Associates, Inc. (NSA) of Laguna Hills, Calif., last week announced a new packaging strategy, dubbed Elite LLC Pak, intended to make its 3270/Elite and 3270/Elite-Plus terminal-emulation software easier to use and less expensive.

NSA has introduced a network license fee under which users can buy the emulators, which support host communications for personal computers connected to token-ring or Ethernet local-area networks that use the 802.2 Logical Link Control protocol.

NSA's 3270/Elite and 3270/ElitePlus packages will run on a LAN file server, from which they can be accessed and used by attached clients. That configuration is intended to ease the installation and upgrade process compared with emulators that run on each personal computer.

Elite LLC Pak is available in six configurations, each of which give users the option of running the single-session 3270/Elite or the multisession 3270/ElitePlus. Prices for Elite LLC Pak range from $18,000 for a 100-user version ($180 per user) to $300,000 for a 5,000-user version ($60 per user). Previously, 3270/Elite cost $295 per user and 3270/ElitePlus was priced at $395 per user.

NSA claims that its new prices are far below those of competitive products from Attachmate Corp., Digital Communications Associates, Inc. and IBM, which the company said range from $395 to $495 per copy.

(continued on page 19)

CrossComm to add SNMP support to bridge/router

ILAN can now monitor Ethernet, token-ring data.

By Paul Desmond
Senior Editor

MARLBOROUGH, Mass. — CrossComm Corp. recently announced it has added support for the Simple Network Management Protocol to its ILAN bridge/router, making the product the first to support both SNMP and an IBM LAN Network Manager agent function.

Support for both SNMP and LAN Network Manager is important for users with nets comprising Ethernet and token-ring local-area networks, which can both be supported by ILAN. Such users can employ an SNMP management station to manage ILAN along with other Ethernet-attached devices while simultaneously managing ILAN and other token-ring nodes using LAN Network Manager.

SNMP is used predominantly to manage Ethernet-attached devices, while IBM's LAN Network Manager is the dominant product for managing equipment linked to token-ring LANs, said Tad Witkowicz, president of CrossComm, based here.

Most existing bridge/routers support SNMP but few, if any, other than ILAN currently support the LAN Network Manager agent because it is proprietary to IBM, Witkowicz said.

ILAN can also send token-ring related alerts to IBM's host-based NetView management system, he said. That gives users a number of options in terms of how to manage ILAN bridge/routers.

"The significant point with this announcement is that we don't want to impose our network management [products] on customers," Witkowicz said. "We are not in the network management business. We are in the internetworking business."

CrossComm offers its own personal computer-based management product, dubbed the Internetwork Management System (IMS), which provides functions

(continued on page 21)

DEC pack lets users build redundant data centers

By Jim Duffy
Senior Editor

MAYNARD, Mass. — Digital Equipment Corp.'s recent spate of announcements included hardware and software designed to set up a redundant network data center to assure system and application availability in the event of a disaster.

DEC's VAXcluster Multi-Data Center Facility (MDF) is an integrated hardware/software system that essentially acts as a redundant data center. VAXcluster MDF connects a primary VAX-based data center with a Fiber Distributed Data Interface-based VAXcluster backup site as far as 25 miles away.

Unlike hot-site backup facilities offered by disaster recovery firms, VAXcluster MDF operates concurrently with the primary data center so databases are updated and transactions are monitored and recorded during run time, DEC said. Hot-site backup facilities, on the other hand, sit idle until activated when disaster strikes.

VAXcluster MDF includes VAX 4000 and 6000 workstations; FDDI controllers and driver software; a software license to link multiple data centers to a single VAXcluster system; Operations Management Station software for managing both the primary and backup data centers; customization, installation, consulting and training services; and documentation.

DEC also unveiled software that reroutes transactions to redundant systems if the primary system is off-line.

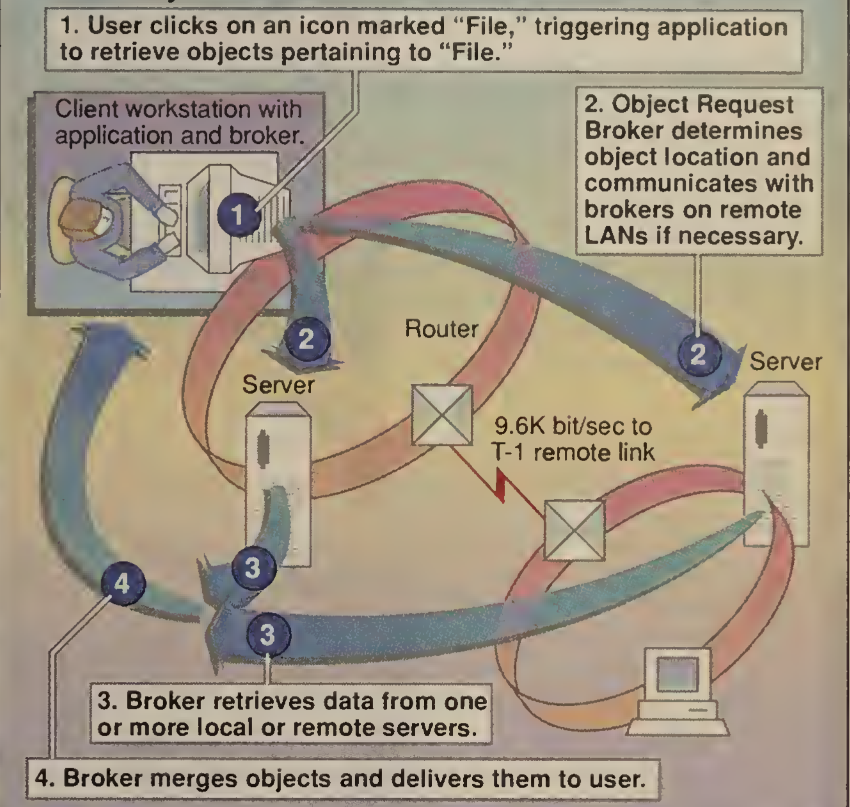
The DEC Reliable Transaction Router for VMS (RTR) resides on VMS-based client, router and server systems in a network. The software defines a primary path among the client, router and server for processing client-initiated transactions.

If the primary router or server is knocked off-line, DEC RTR routes the transaction to secondary or tertiary servers and routers, according to DEC.

VAXcluster MDF software is priced at $50,000 per data center and is expected to be available in December. Total system cost — for software, plus VAX processors and FDDI controllers — is priced according to configuration.

DEC RTR software pricing starts at $3,000 and is available now.

No object can hide from OMG's broker


1. User clicks on an icon marked "File," triggering application to retrieve objects pertaining to "File."
Client workstation with application and broker.
2. Object Request Broker determines object location and communicates with brokers on remote LANs if necessary.
1
2
2
Router
Server
Server
9.6K bit/sec to T-1 remote link
3
3
4
3. Broker retrieves data from one or more local or remote servers.
4. Broker merges objects and delivers them to user.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: HYPERDESK CORP., WESTBOROUGH, MASS.

Firms mull support for OMG task broker

Apple, IBM and Microsoft support would ensure smooth rollout of new object-oriented applications.

By Jim Duffy
Senior Editor

NEW YORK — Apple Computer, Inc., IBM and Microsoft Corp. are evaluating support of the Object Request Broker, a set of programming interfaces that allow object-oriented applications to share data across a network.

Should Apple, IBM and Microsoft fail to embrace the broker, users and corporate software developers will be faced with a myriad of different object request and response mechanisms that are not portable among disparate multivendor systems, analysts said.

Users and third-party software developers will be forced to choose a broker specification and, in doing so, will be locked into a vendor, to a certain degree.

Moreover, competing standards will delay product development and release as third-party application developers attempt to sort out which specification will have the higher degree of market penetration, analysts said.

All three vendors have ambitious plans to develop and license object-oriented applications and development environments, but none have pledged support for the broker yet.

The software, which was introduced two weeks ago by the Object Management Group (OMG) — a consortium of vendors and users looking to devise a standard framework for object-oriented application development — is being hailed as the vanguard of distributed multivendor computing ("OMG unveils key tool for distributed applications," *NW*, Nov. 4).

The broker software resides on client workstations in an object-oriented, heterogeneous network. It allows objects on multivendor systems in that network to initiate and receive requests and responses on behalf of client applications to locate, merge and deliver data pertinent to the application.

Apple and IBM, as part of their joint development activity disclosed in July, will form an independent joint venture to develop a next-generation operating environment based on object-oriented technology. The technology will be available in the mid-1990s, the joint venture will license it, and IBM and Apple will use it in their respective OS/2 and AIX, and Macintosh products.

An IBM spokesman said the firms are evaluating the software, but added it is premature to say whether the IBM-Apple joint venture will adopt it. An Apple spokeswoman said the IBM-Apple venture is not yet announcing support for specific standards but will be evaluating technology and making endorsements in the future.

But OMG President Chris

(continued on page 21)

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Data Packets

continued from page 17

Siemens Nixdorf Information Systems, Inc. and the Cambridge, Mass.-based **Open Software Foundation, Inc. (OSF)** recently signed an agreement under which Siemens Nixdorf will create a reference implementation of the OSF's Distributed Computing Environment (DCE) for the Unix System V Release 4 operating system.

DCE is intended to support distributed applications running on a network of multivendor computers using different operating systems. A reference implementation of DCE is a version adapted for a particular operating system and computer.

Siemens Nixdorf's version will run on the company's MX300i machine, which is based on an Intel Corp. 80486 processor. It will join existing DCE reference implementations from IBM for its RISC System/6000 under AIX and from Digital Equipment Corp. for its DECstation 3100 running OSF/1.

CompuServe, Inc. is offering a price incentive promotion, dubbed Pacesetter, for the first 20 users that sign up for its Frame-Net frame relay service by Jan. 31. CompuServe will charge a single flat fee, based on access speed, that covers installation plus two months of Frame-Net and local telephone company access charges for three networked sites.

For example, the charge for three sites with 56K bit/sec access would be $3,000, or roughly half the typical fee.

In other frame relay news, the Local Management Interface (LMI) specification was recently approved as part of the CCITT Q.933 Annex A frame relay standard. LMI is the extension to the frame relay standard proposed a year ago by **Cisco Systems, Inc., Digital Equipment Corp., Northern Telecom, Inc. and StrataCom, Inc.** The specification defines a way for network equipment to provide information on private virtual circuit (PVC) status, including the addition and deletion of PVCs.

The Consultative Committee on International Telephony and Telegraphy typically takes three to four years to approve a standard.

Pacific Bell has added an X.400 name search directory feature, based on Digital Equipment Corp.'s Enterprise Messaging Server, to its public electronic messaging system.

The feature enables users of Pacific Bell's Connection service and private messaging systems to locate X.400 addresses of other users, download addresses and register or modify their own X.400 address.

The name search directory is intended to serve as an interim solution to the X.500 directory standard that is expected to be widely deployed in three to five years, according to the carrier.

Unisys Defense Systems, Inc.'s Space Systems Division is teaming up with **Bendix Field Engineering Corp.** on a $240 million contract to maintain ground stations for the U.S. Air Force Satellite Control Network, which directs the nation's military satellites. The contract was awarded by the Air Force Logistics Command.

Unisys is responsible for software maintenance and data management, including configuration control and computer-aided design and manufacturing tools.

The two companies are also joining forces on the space shuttle and space station operations projects.

NCR Corp. recently announced that it is expanding its help-desk services program by offering customers on-site training and tools to implement their own internal help desk.

Previously, NCR personnel provided customers with help-desk services from an NCR-staffed facility in Dayton, Ohio. The company will still provide that service but is now offering customers the option of establishing their own help-desk facilities.

NCR is providing three options, depending on customer needs: Self-Instruct, a training manual for help-desk implementation, responsibilities, staffing methods and problem management techniques; On-Site, a training manual and seminar teaching systems architecture and problem resolution techniques; and Intern, in which NCR staffers work with the customer to devise problem-solving techniques and provide hands-on training at an NCR service center.

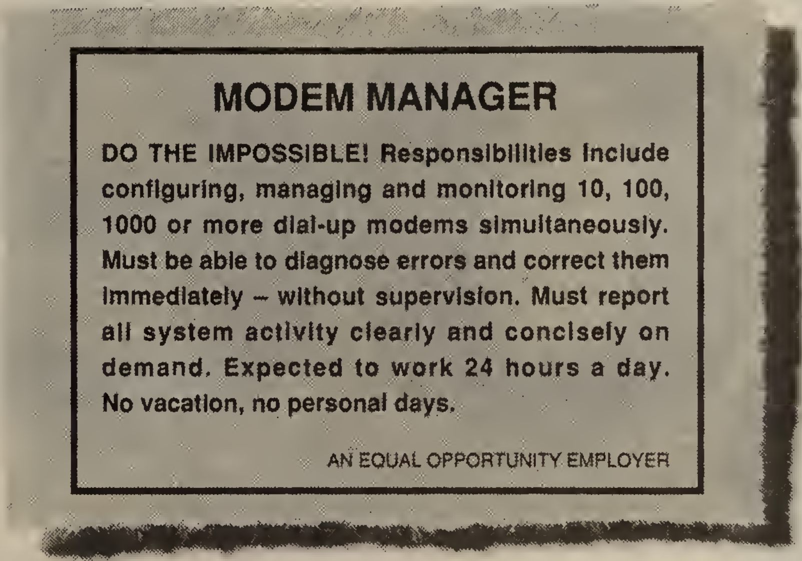
Each option is priced as a onetime fee ranging from $115 to $6,115.

IDEA of Tempe, Ariz., recently announced a new model of its IDEA Concert line of IBM-compatible controllers that supports as many as 96 attached 3270 devices. The new model, the IDEA Concert 10600, can be configured as a remote, local or token ring-attached IBM 3174-compatible controller. IDEA's previous high-end controller, the 10500, supported only 64 3270 devices.

The 10600 will be available next month. Pricing starts at $9,995.

IDEA also announced price reductions ranging from 9% to 17% for its existing controllers.

In addition, IDEA unveiled a new switchable 4M or 16M bit/sec token-ring adapter for its 10400, 10500 and 10600 controllers. Each controller can support two of the adapters, which are priced at $1,950 each.



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Firms mull OMG task broker

continued from page 17

Stone said he believes IBM and Apple will embrace it.

"IBM and Apple will need the object model and message services," Stone said. "They are very participatory [in the consortium's activities] and need what the OMG is working on."

John Rymer, an analyst with Patricia Seybold's Office Computing Group in Boston, said he believes IBM and Apple will license the broker from one of the six companies that contributed to its development: Digital Equipment Corp., Hewlett-Packard Co., HyperDesk Corp., NCR Corp., Object Design, Inc. and SunSoft.

Licensing a vendor's implementation "will reduce time to market and will build on the efforts of other vendors in defining and building a market with this software," Rymer said.

Microsoft, on the other hand, has developed its own Object Linking and Embedding (OLE) specification to integrate information from different applications. OLE enables Microsoft Windows-based applications to embed objects from other OLE-adherent Windows applications, creating a compound document. As the individual elements that compose the document are altered or updated, the document is also altered or updated.

But OLE is tuned for use in user workstations and, unlike the broker, is not architected to support object requests across a distributed computing environment. It might make sense, therefore, for Microsoft to embrace the broker software to update OLE with distributed computing capabilities, analysts said.

Microsoft, however, cannot see a fit right now for the broker in its OLE strategy.

"We're looking at the broker as an emerging standard in the Unix community," said Edward Jung, a Microsoft software architect. "It's not so clear that it's useful running on personal computers. It's a little less optimized for our applications."

As specified now, the broker occupies too much workstation memory, Jung said. That is less of a concern for Unix environments than it is for DOS and Windows environments, he added.

Microsoft is also developing code internally to optimize OLE for networks, Jung said. It has to evaluate whether there is a role for the broker in that code.

Nonetheless, Microsoft is trying to determine if it can strip out and implement pieces of the software and still maintain OMG compliance and interoperability with the broker, Jung said.

"Microsoft has the most significant existing technology available that wasn't integrated into the OMG proposal," said Tom Willmott, vice-president of Aberdeen Group, Inc. in Boston.

Rymer said Microsoft may extend OLE in the future to be distributed. "They may adopt the HyperDesk or HP approach to implement a distributed approach. But they've always gone their own way in the past," he said. "As long as they implement the broker [application program interface], who cares?" ◻

CrossComm to add support

continued from page 17

such as the ability to isolate network problems.

The company has also licensed Hewlett-Packard Co.'s OpenView net management system and will use it to enhance IMS, such as by giving it a graphical user interface, Witkowicz said. But support for the LAN Network Manager agent is the big differentiator for CrossComm.

It took CrossComm two years to develop an agent that mimics the functionality of IBM's LAN Network Manager agent, he said. LAN Network Manager monitors media access control (MAC)-level frames on a LAN. Source routing bridges cannot pass MAC-level frames, which means special agent software is required to collect such frames and forward them to a central management system.

ILAN Release 4.02 software with SNMP support as a standard feature is available 60 days after ordering. ILAN pricing starts at $6,000. ◻

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>
> **Jim Allchin**
> Vice-president of
> advanced Windows services
> Microsoft Corp.
> Bellevue, Wash.

Netnotes

Intellicom, Inc. recently released a series of products to help network administrators manage and interconnect Ethernets.

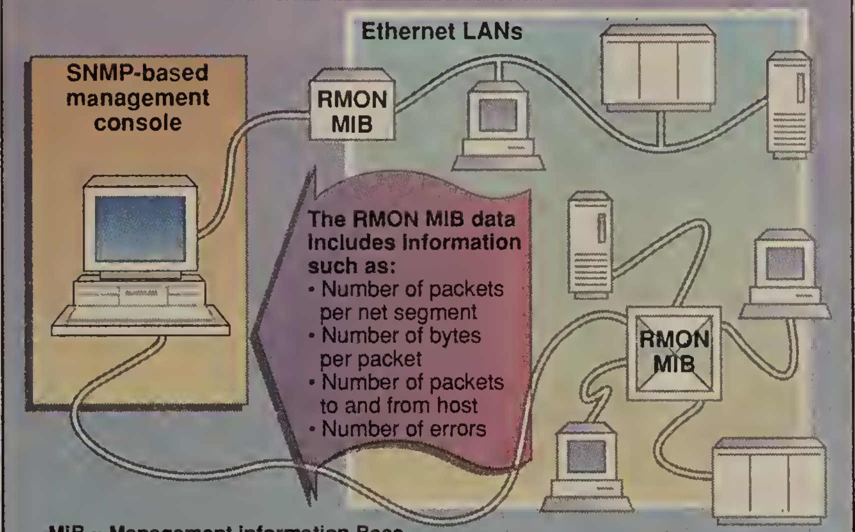
The QuickNet 6000 is a transparent self-learning Ethernet bridge that contains a Simple Network Management Protocol (SNMP) Management Information Base (MIB) II agent. The QuickNet 6000 can examine more than 27K packet/sec and forward more than 14.7K packet/sec. It is available now for $1,975.

The Quick-Net 5000 is an SNMP MIB II-compliant net management system consisting of software and a network interface card for Intel Corp. 80386-based machines running Microsoft Corp. Windows 3.0. Quick-Net 5000 is available now for $995.

The TPair-324/LB is a 24-port 10Base-T wiring concentrator with an integrated bridge and SNMP management. It is designed for departmental networks of up to 100 nodes interconnected using unshielded twisted-pair wiring. The TPair-324/LB is available now for $3,300.

Intellicom's TPair-PNA is a 10Base-T-compliant external Ethernet network interface adapter that comes with Novell, Inc.'s Open Data Link Interface and NetWare 2.X drivers. The TPair-PNA is available now for $399.

RMON MIB in action


Ethernet LANs
SNMP-based management console
RMON MIB
The RMON MIB data includes information such as:
• Number of packets per net segment
• Number of bytes per packet
• Number of packets to and from host
• Number of errors
RMON MIB

MIB = Management Information Base
SNMP = Simple Network Management Protocol

RMON-based devices, such as stand-alone monitors or hub modules, collect management information from their respective network segments and send that information to the SNMP-based central management console.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: LEXCEL, FULLERTON, CALIF.

Soft-Switch adds new link options to E-mail system

Enhances connectivity with LANs, IBM products.

By Caryn Gillooly
Senior Editor

WAYNE, Pa. — Soft-Switch, Inc. recently introduced a series of products that enhance the ability of its host-based electronic mail system to work with local-area network-based E-mail products and other mail systems in IBM environments.

Topping the list of products for Soft-Switch Central, a multiprotocol E-mail engine that runs on IBM mainframes, is a new version of the firm's Message Handling System (MHS) gateway.

The existing product, the Soft-Switch MAILbridgeServer/MHS, lets Soft-Switch Central users interact with users on other mail systems that employ Novell, Inc.'s MHS mail transport protocol, such as WordPerfect Corp.'s WordPerfect Office, Da Vinci Systems, Inc.'s Da Vinci Mail and CE Software, Inc.'s Quick Mail.

> DS/EAB will be able to synchronize updates of IBM-based DISOSS E-mail directories.

▲▲▲

The new version of the host-based product continues to provide this connectivity but with more timely message delivery.

According to David Foster, vice-president of marketing at Soft-Switch, based here, the gateway now supports interactive message exchange instead of batch transports.

The other new products are designed to enhance connectivity between E-mail users and IBM environments.

First in this category are two new versions of Soft-Switch's Mail Monitor — Mail Monitor/DISOSS and Mail Monitor/OfficeVision — for IBM's Distributed Office Support System and OfficeVision products, respectively.

Soft-Switch's existing Mail Monitor is designed to monitor the flow of E-mail traffic through Soft-Switch Central systems. This is done by addressing probes to certain addresses and then monitoring their return.

With the two new products, which are turnkey hardware/software packages, these same capabilities are extended to support IBM messaging environments. "This lets you monitor your [mail system] even if you're not on the net," Foster said.

The second IBM connectivity product is called Soft-Switch Directory Synchronization/ Enterprise Address Book (DS/EAB). This is basically a software product that contains IBM's EAB shadowing protocol, which is used to synchronize directories of various OfficeVision environments throughout an enterprise.

The new product will be able to synchronize updates of IBM-based DISOSS and OfficeVision E-mail directories throughout a Soft-Switch network.

When DS/EAB is used in conjunction with other Soft-Switch directory products, changes in OfficeVision directories can be

(continued on page 27)

New SNMP MIB aids traffic management

RMON spec will enable net managers to centrally collect net traffic data from remote, local Ethernets.

By Caryn Gillooly
Senior Editor

A new Management Information Base (MIB) is emerging for the Simple Network Management Protocol (SNMP) that will enable administrators to use SNMP to monitor local-area network traffic instead of just the devices on the LAN.

The MIB specification, called RMON for remote monitoring, is an Ethernet-specific MIB that will let administrators use a central management station to collect network traffic data from local or remote Ethernets.

The RMON MIB is designed to monitor traffic crossing Ethernets, collecting information such as the number of packets per network segment, number of bytes per packet, number of packets sent to and from the host, and number of errors.

It will be possible to implement the RMON MIB in a stand-alone box dedicated to collecting RMON statistics within such internetworking devices as bridges, routers and hubs or in nondedicated LAN workstations.

According to sources, it has not been decided whether the MIB specifications will require a local hard disk to collect the captured information or forward it directly to the SNMP console.

Any vendor's central management console supporting the RMON MIB will be able to obtain information from any other vendor's RMON implementation.

The RMON MIB differs from the existing MIB I and II specifications in the information it collects. For example, current MIBs are designed to gather statistics about individual network devices and information about device speed, device address and the number of packets sent through each device interface.

Also, unlike MIB I and II, the RMON MIB will let administrators set thresholds to help catch problems before they bring down a network. It also includes the capability to capture packets, assisting net managers in creating trend graphs, performing historical analysis and optimizing net performance.

In fact, the entire group of capabilities incorporated into the RMON MIB are similar to those found in many existing protocol analyzers. But the RMON MIB will be standard, and RMON devices from one vendor will work with MIBs from other vendors.

Users and vendors are eagerly anticipating the RMON MIB. Several vendors have said they will support the MIB when it is released, and some have even gone so far as to announce products that include a prestandard version of the MIB (see "Vendors to back new RMON spec," page 26).

"This is the next frontier in network management," said Charles Robbins, director of com-

(continued on page 26)

Human resources tool for LANs goes multilingual

By Timothy O'Brien
West Coast Bureau Chief

WALNUT CREEK, Calif. — PeopleSoft, Inc. recently announced a release of its PS/HRMS local net-based human resources management system (HRMS) to serve the needs of multinational corporations.

Version 2.0 adds multilangual and currency support, expanded application development tools, new payroll functionality and reporting capabilities, as well as improved performance.

"With 2.0, users can simultaneously pull up screens in different languages to look at the same database," explained Linda Zecher, vice-president of marketing at PeopleSoft.

When PS/HRMS was introduced in 1989, it was the first fully integrated payroll, benefits and HRMS product based on a client/server architecture that supported Microsoft Corp.'s Windows graphical user interface, multiple back-end SQL relational databases and multiple hardware platforms.

HRMS front-end applications can interface with either GUPTA Technologies, Inc.'s SQLBase or IBM's DB2 back-end database servers. Next year, PeopleSoft will add support for Digital Equip-

(continued on page 27)

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SNMP MIB aids management

continued from page 23

munications research at Aberdeen Group, Inc., a consultancy in Boston. "This is another step toward a complete network monitoring solution."

Standardization of the RMON MIB is being spearheaded by a 10-vendor working group within the Internet Engineering Task Force (IETF). The vendors involved are Cabletron Systems, Inc., Concord Communications, Inc., Frontier Software, Hewlett-Packard Co., Lexcel, Network Application Technology, Network General Corp., Novell, Inc., Spider Systems, Inc. and SynOptics Communications, Inc.

The MIB is based on Novell technology, designed around the MIB used in Novell's LANtern, a stand-alone network monitoring device.

Although the MIB is currently only a draft standard within the IETF, the group expects to have a working standard by next September.

According to Michael Erlinger, chairman of the RMON working group, the RMON MIB is only one of many MIBs currently being explored by the IETF.

He added that one of the next MIBs the group expects to bring out is an RMON MIB for the token-ring environent, although he did not have a time frame for when that version might reach standardization. ☒

Vendors to back new RMON spec

Although the Internet Engineering Task Force has yet to finalize the specification for the RMON Management Information Base (MIB), which would enable users to monitor traffic on Ethernet local networks, some vendors are already laying plans to support the MIB.

Frontier Software Development, Inc., Hewlett-Packard Co. and ProTools, Inc. have already backed the specification and committed to incorporate it into their products ("HP, other vendors back SNMP RMON standard," *NW,* Sept. 30).

Digital Equipment Corp. will support the RMON MIB in its DEC Management Control Center (DECmcc) Management Station for Ultrix Version 1.1 this month, said Bill Gassman, DEC marketing manager for network management.

The DECmcc Management Station for Ultrix consolidates the DECnet Phase IV management system under one interface.

DEC's recently announced TCP/IP SNMP Access Module includes a compiler to integrate MIBs, including RMON, into DECmcc Director, the company's Open Systems Interconnection-based enterprisewide management system, Gassman said ("DEC readies router, net mgmt. blitz," *NW,* Oct. 7).

Gassman did not disclose if or when RMON will be supported under the access module, but he said DEC is looking at writing DECmcc Director Function Modules that are specific to RMON.

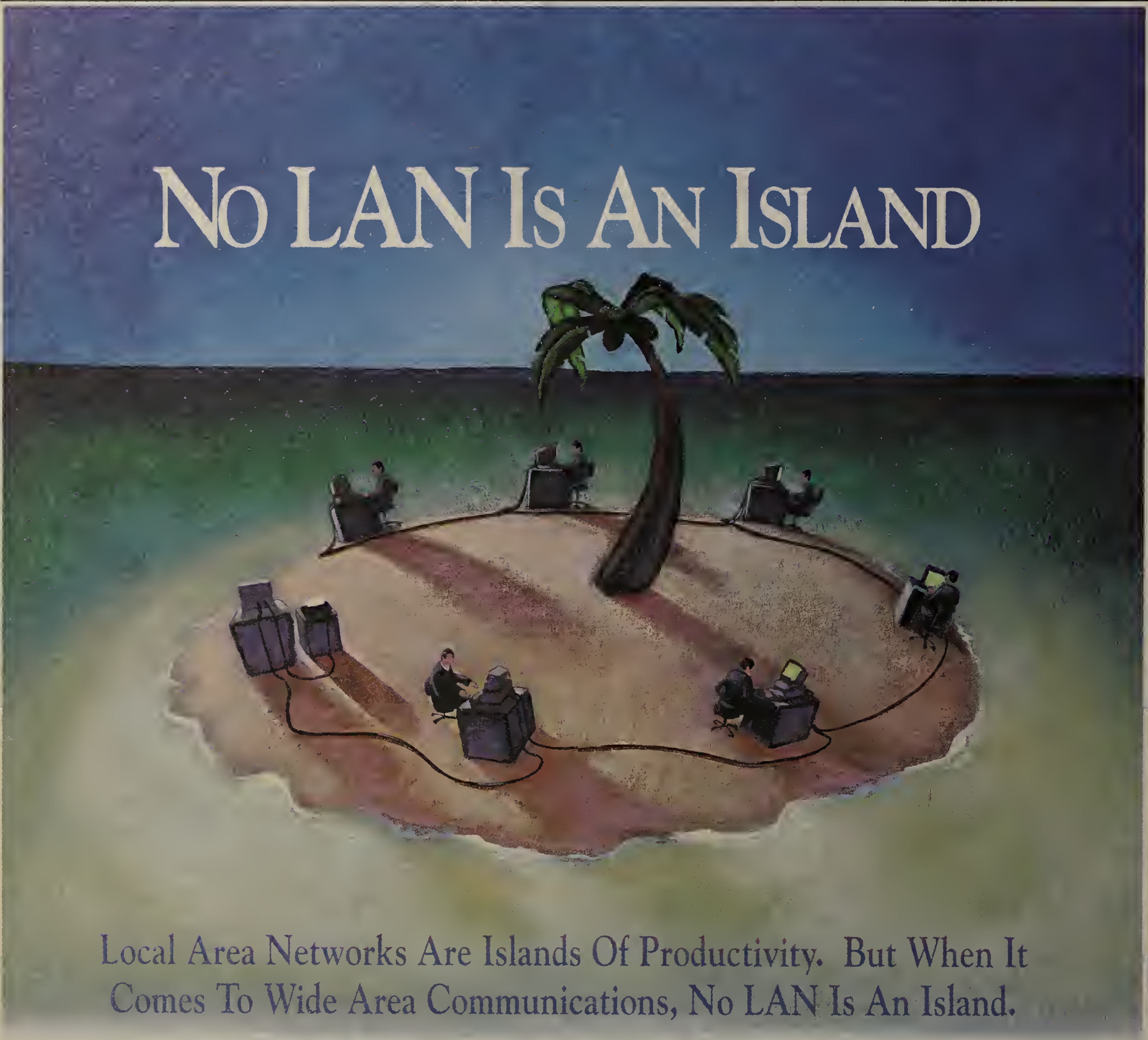
"[RMON] allows us to build applications that look at all the different LAN probes on the market," Gassman said.

IBM, DEC and NCR Corp. are evaluating the RMON MIB and may support it in future products.

IBM's commitment to the RMON MIB depends on user demand. "If we see customers requiring it, we will support it," said Sanjiv Ahuja, manager of AIX network management services, IBM Network Systems.

NCR is only waiting for an RMON implementation to emerge so it can test it, said Chester Harris, NCR manager of marketing for network and systems management.

— Jim Duffy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Program goes multilingual

continued from page 23

ment's Corp.'s Rdb, Microsoft's SQL Server, Oracle on Hewlett-Packard Co.'s HP/UX and HP's ALLBASE.

With Version 2.0, PeopleSoft has made key changes in the development tools integrated into PS/HRMS so users can now modify their application to support multilingual capabilities.

For example, multicurrency support enables the system to identify different currencies within the database so users can enter and display employee salaries in local currency amounts while using their own native language.

Although users will initially need to use development tools to do the language and currency translations, over time, PeopleSoft plans to make different language versions — such as French or German — available as part of specific releases.

These tools, called PeopleTools, consist of nine products that enable users to customize and maintain their PS/HRMS application without changing source code.

Also new in 2.0 are a Tree Editor and Object Security.

By using the Tree Editor, customers can maintain data within a "tree-like" structure to view, determine, delete or change relationships among departments and associated data for organizational reporting.

The other new feature, Object Security, enables large customers to centrally maintain core application data integrity across a distributed environment while allowing users to customize the application regionally for native language, currency or company requirements.

Additional enhancements include new auditing and editing capabilities in the tools, new payroll module functions such as options for check sequencing and the ability to process one check for multiple jobs, new payroll reporting features and performance improvements up to 50% over the previous version.

To take advantage of its graphical client/server development tools and back-end database support, PeopleSoft is currently developing a set of financial accounting software applications that will be announced next year.

Version 2.0 of PS/HRMS is expected to begin shipping Nov. 30 for the SQLBase on OS/2 and DB2 on MVS.

Pricing ranges from $150,000 to $700,000, depending on hardware configuration.

The Release 2.0 is available as a free upgrade to customers covered under PeopleSoft's PeopleCare customer support and maintenance agreement.

PS/HRMS supports Named Pipes and Network Basic I/O System-compatible network software, Novell, Inc.'s NetWare, Banyan Systems, Inc.'s VINES, Microsoft's LAN Manager, IBM's LAN Server and the Transmission Control Protocol/Internet Protocol. ◘

Soft-Switch adds options

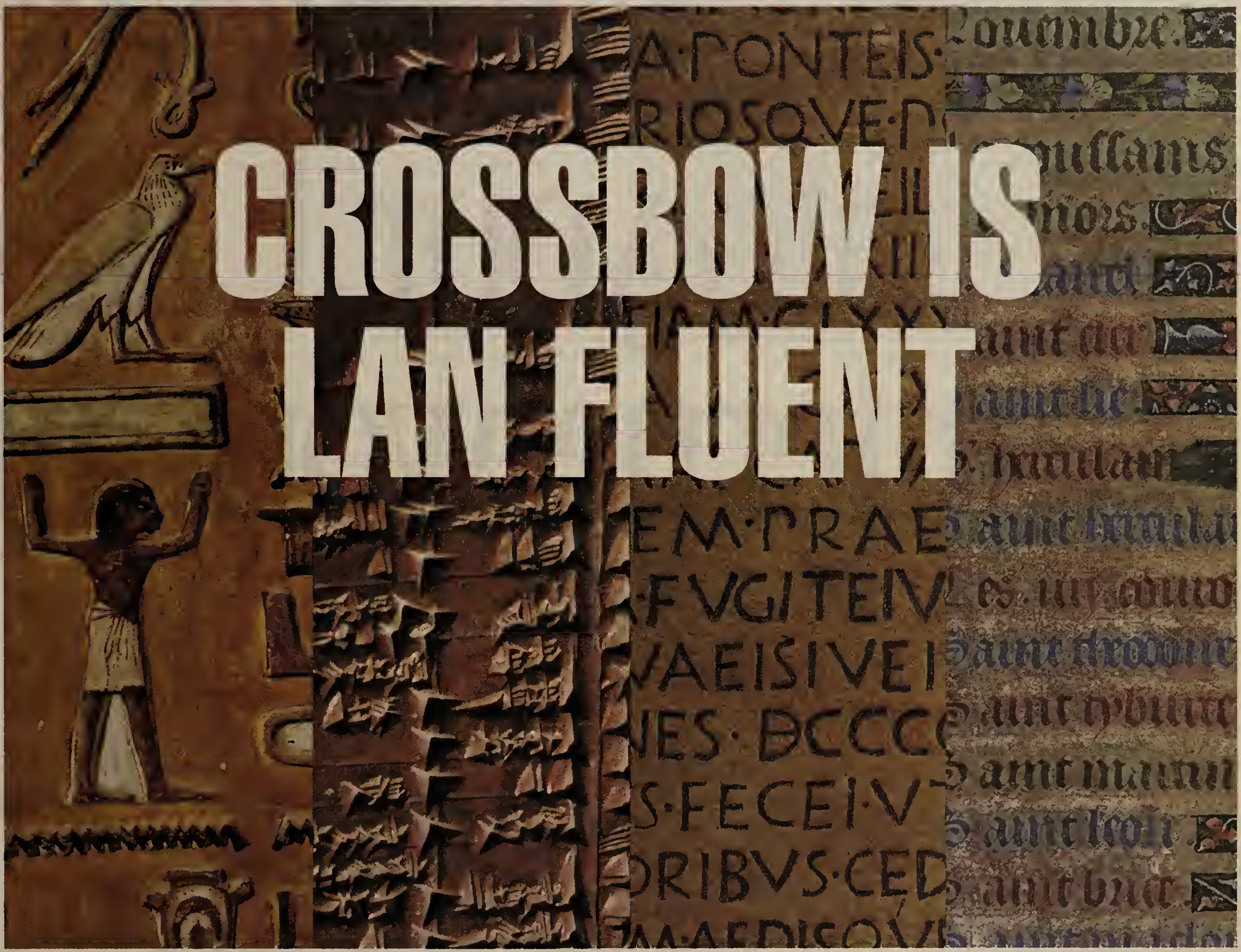
continued from page 23

propagated throughout other vendor-specific directories tied to the Soft-Switch backbone, such as Wang Laboratories, Inc.'s Wang Office, Lotus Development Corp.'s cc:Mail and Digital Equipment Corp.'s DDS.

Finally, Soft-Switch introduced the SNAPI Client Library/CICS. This product is a set of Soft-Switch Network Application Programming Interfaces (SNAPI) that will let customers using CICS applications exchange mail with non-CICS users through a remote procedure call-based interface.

"This is important to the LAN user because it bridges LAN E-mail users to mainframe users," Foster said.

All products are available now in beta version. The MHS Gateway starts at $1,665; the Mail Monitor/DISOSS and Mail Monitor/OfficeVision hardware/software packages cost $50,000; the DS/EAB costs $20,000; and the SNAPI Client Library/CICS costs $5,000. General availability has not been determined. ◘



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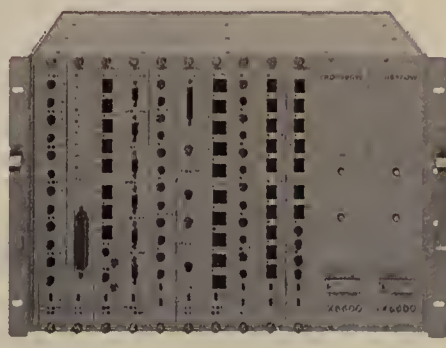

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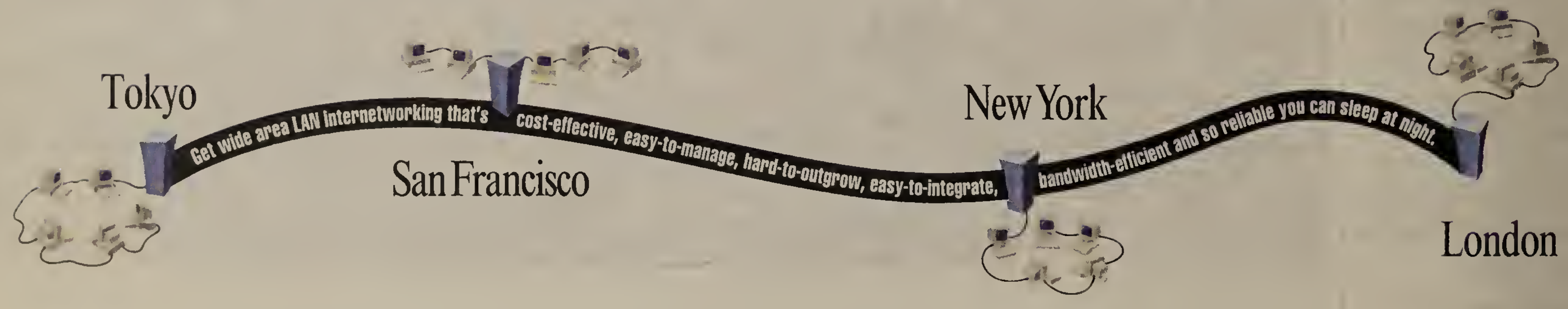
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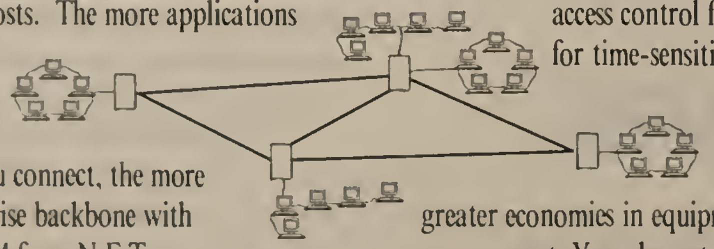

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MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USER GROUPS AND ASSOCIATIONS

Dialogue

Which eats up a bigger part of your operating budget: voice or data communications?

“Traditionally, voice made up the greater percentage of our operating costs, but it's been shifting to data communications. Five years ago, voice comprised three-fourths of our budget. Today, it's a little more than half.

“We've had growth in data traffic because the prices of dedicated lines have come down. All of our locations worldwide are connected to the main data center and processors in each of our factories. Our data network is increasingly becoming one of LANs connected over wide-area links.

“Occurring at the same time as the growth in data traffic are major cost reductions in voice due to competition.”

Charles Snell
Director of computing and communications
Harris Corp.
Melbourne, Fla.

“It's remained about 50-50 for the past five years. But what has changed is that data communications technology has enabled users to achieve dramatically greater capacity at lower costs.

“So while expenses have remained even for both, capacity on the data side has increased over the years.”

Jeff Marshall
Managing director of communications
Bear, Stearns & Company, Inc.
New York

“Our voice budget is about five times greater than our data communications budget. We are a highly automated company and a heavy data communications user, but our voice budget is still significantly higher.

“Data communications is simply cheaper. We have many leased lines that can accommodate greater capacity.

“Data communications budgets are much better documented, managed and controlled than voice costs because data communications responsibility is typically more centralized than telecommunications.”

John O'Kane
Vice-president of MIS
Executone Information Systems, Inc.
Darien, Conn.

Sea-Land rethinks recovery plan after Comdisco outage

Flooding hits Comdisco facility in New Jersey.

By Barton Crockett
Senior Editor

CARLSTADT, N.J. — A major user of Comdisco, Inc.'s disaster recovery services is reevaluating its relationship with the company after a major Comdisco facility here was knocked out by severe storms that battered the East Coast.

The recent outage halted Comdisco's electronic vaulting services for some users, including the billion-dollar shipping firm Sea-Land Service, Inc., which is exploring whether it can get out of long-term contracts for Comdisco services.

On Oct. 31, a storm flooded the parking lot in front of two buildings here that support electronic vaulting and hot-site disaster recovery services. The flooding knocked out a transformer carrying electricity from two power grids to the Comdisco facilities, according to John Jackson, executive vice-president of Comdisco Disaster Recovery Services, Inc.

The power outage occurred at 5:15 a.m., leaving one building, which houses a Comdisco hot site, without power until a diesel generator was fired up at 11:45 p.m. that day. A second building, which Comdisco uses to provide electronic vaulting services, also lost power, forcing the company to move into the hot-site building in order to restore operations.

Comdisco's electronic vaulting service was down for about 24 hours, according to the vendor.

With electronic vaulting, copies of a user's data are sent continuously over private lines to a remote data center and stored on tapes that can be loaded into backup computers if a user's primary computers and data are knocked out.

Emiel Trombetti, Sea-Land's information systems disaster recovery manager in Elizabeth, N.J., said his company lost electronic vaulting services from Comdisco when the outage hit that Thursday morning until about 8:30 a.m. Friday.

Sea-Land uses a T-3 to send data from its Elizabeth data center to the Comdisco data center here.

The electronic vaulting outage did not cause lasting damage to user operations because it only affected backup copies of data. But Trombetti said the outage made him question Comdisco's professionalism.

“It should never have happened,” Trombetti said. “I don't think there was any other company in the New York area affected [by the storm] except the so-called experts. I think Comdisco lost a lot of credibility.”

Trombetti said the problem was exacerbated by the fact that the power outage also apparently knocked out a private branch exchange that served the Comdisco facilities. For three hours, Sea-Land was unable to call Comdisco

(continued on page 70)

EXECUTIVE BRIEFS

BY WAYNE ECKERSON

Expert systems improve service. Almost 90% of all corporate service organizations expect to be using expert systems within the next three years, especially in help-desk and field service applications.

That finding is based on a survey of 3,500 service managers conducted by ServiceWare, Inc., a consulting and market research firm in Verona, Pa., serving the services industry.

The 180-page report, titled “We're Off to Seize the Wizard: The Revolution in Service Automation,” also stated that the average software budget for service groups currently exceeds $120,000.

The strong support for intelligent systems was greater than expected, according to Jeff Pepper, president of ServiceWare. While there has been much interest in expert systems within the industry, there are few examples of companies that actually deployed such systems, he said.

Pepper said few service groups have openly discussed their use of expert systems because they either want to conceal what they consider to be a competitive advantage or have had no success with the systems.

MANAGEMENT PROFILE

GE's Stanley Welland

Network pioneer's vision brings success

GE's Stanley Welland relies on ability to predict trends in technology to position firm for future.

By Wayne Eckerson
Senior Editor

When Stanley Welland attended a business dinner at the World Trade Center in New York as a favor to his boss in 1981, he had little idea the meeting would be a watershed point in his professional career.

That evening, Welland, then a manager of technology planning at Merrill Lynch & Company, Inc., hit it off with Guy Tozzoli from the Port Authority of New York and New Jersey, who was looking for Merrill Lynch's help in starting a company to provide high-speed network services over optical fiber to New York's business giants.

The company, New York Teleport, got off the ground two years later despite formidable obstacles, and by introducing competition into the local loop it forever changed the landscape of metropolitan network services.

For Welland, the New York Teleport project marked the beginning of the two most challenging and exciting years of his career. It also completely changed his mind about the future of carrier-based services.

“I went from wanting to own the network to wanting to buy [network services from carriers],” said Welland, who was Merrill Lynch's point man in the New York Teleport project. “I saw the abundance of infrastructure that would soon be available [from alternative bypass, local and interexchange carriers], and it no longer made sense to stick with private networks.”

This notion formed the basis of Welland's networking strategy when he came to General Electric Co. in 1985 to head its corporate network planning group.

At the time, GE had an unreliable analog voice network and a point-to-point data network that had evolved without any central coordination. Moreover, the year before, the company had purchased Radio Corp. of America (RCA), whose T-1 network needed to be merged with GE's.

The GE game plan

The first thing Welland did was migrate GE's analog traffic onto RCA's network where possible. Then, instead of expanding RCA's net, Welland asked AT&T to develop a network service that would support the remaining GE sites.

To meet Welland's request, AT&T dedicated System 85 switches in a number of central offices to serve as nodes in GE's private network.

Under the arrangement, AT&T would own the equipment and manage GE's network. Eventually, GE would migrate all of its voice and data traffic off its private network to the new service, which AT&T later tariffed as the Bandwidth Management Service (BMS).

“We wanted to get out of the telephone business and move much of the responsibility for managing our voice and data network to the carriers,” Welland

(continued on page 31)

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Network pioneer's vision brings success

continued from page 29

said. "The alternative was to install an intelligent multiplexer in every GE location connected to the backbone, which was not the smartest, most cost-effective solution."

Strategic vision

Welland attributes much of the success he has enjoyed over the years in the networking profession to his ability to divine the direction in which technology and the industry are headed and sell people on this vision.

Besides his involvement in the development of BMS and the New York Teleport project, Welland has been a pioneer on many accounts.

While a communications adviser at Exxon Enterprises, Inc. from 1977 to 1981, he was an early board member of InteCom, Inc., one of the first manufacturers of digital private branch exchanges. In addition, he steered GE into becoming the first commercial organization to sign a Tariff 12 contract with AT&T and one of the first companies to sign up for AT&T's Software-Defined Network service.

"Many people have strong opinions about what the future holds, but few act on them for fear of being wrong," Welland said. "My philosophy is that you have to take calculated risks that are in the best interest of the company; otherwise, you eventually come in last."

Welland made an aggressive commitment to implement virtual voice services as soon as they became available in 1987. By 1990, GE had migrated 100% of its voice traffic to virtual network services offered by AT&T, MCI Communications Corp., Rochester Telephone Corp. and US Sprint Communications Co.

GE may eventually migrate its data traffic to public services once those services prove reliable and cost-effective. Welland said he is deeply interested in frame relay and believes it may replace much of GE's T-1 backbone network. GE is about to start a frame relay trial with a carrier Welland declined to disclose.

Two years ago, Welland began shifting his attention overseas in response to an executive commitment to make GE a stronger global competitor.

"In early 1989, our chairman started talking about GE as a globally interconnected enterprise," Welland said. "That was the signal to us to get a network in place in Europe and the Far East."

That summer, GE signed a deal for international voice and data services at the United Nations with British Telecom (BT) International, Inc., France Telecom and AT&T. GE now has hubs in Amsterdam, London, New York and Paris that are interconnected using E-1 services. In addition, the conglomerate recently implemented T-1 circuits to Tokyo and is gradually bringing up connections to other Pacific Rim nations.

"No one came and told us to build an international network. We saw the direction the company was going and wanted to have the network in place as soon as people needed it," Welland said.

Looking into the future now, Welland sees a wealth of new technologies that offer significant opportunities for GE, including cellular telephones and desktop videoconferencing.

Already, GE has signed up for a service from BT International that connects cellular phone users in the U.K. into GE's virtual voice network in the U.S. This enables GE employees in the U.K. to use their car phones and GE's dialing plan to call colleagues in the U.S. The company is working out a similar arrangement with cellular and interexchange carriers in the U.S.

"One of the scary things about this industry is that technology moves so fast that just when you think you have the answer, they change the question," Welland said.

Staying ahead of the technology curve requires the skill of a good pool player. "You have to plan your shots and where you want to position the cue ball two or three moves ahead without taking your eye off the shot at hand," he said.

Welland said he scours newspapers and magazines for ideas and innovative approaches to technology and is not afraid to borrow ideas from other users.

The operations hot seat

While Welland believes it's his job to be a visionary and plan ahead, he doesn't forsake the operational aspects of networking. Welland constantly checks trouble tickets via voice mail, sometimes to the consternation of his wife.

Anytime a trouble ticket is opened or the status of the ticket changes, an operations person calls that information into a voice mail box that can be accessed by Welland and business unit managers whose circuits might be affected.

"I can't sit down to dinner in a restaurant or go off with the family anywhere until I've called into the mailbox and am confident that outstanding problems have been resolved," Welland said. "You can constantly be in the hot seat if problems aren't managed properly."

Sometimes Welland will call a vendor directly if he is unhappy or uneasy about a problem on the network. The voice mail system lets him know what's going on in the network without interfering with or appearing to second-guess his network operations staff.

As Welland put it, "I want to stay on top of everything without being intrusive and take risks without appearing to be out of control." ◼

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The ICA will publish a journal of all qualified Call for Innovation papers. Presentations will also be considered for publication in ICA's award-winning *Communiqué*, a publication that reaches network executives in nine countries. In addition, Call for Innovation participants will be able to share their experiences with peers in a one-on-one setting on the exposition floor during special "Poster Sessions" at the ICA conference. **All entries must be received by December 31, 1991.**

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World News

Thirty-seven carriers recently signed agreements to buy capacity on two transatlantic fiber-optic cables scheduled to commence operations in 1992 and 1993.

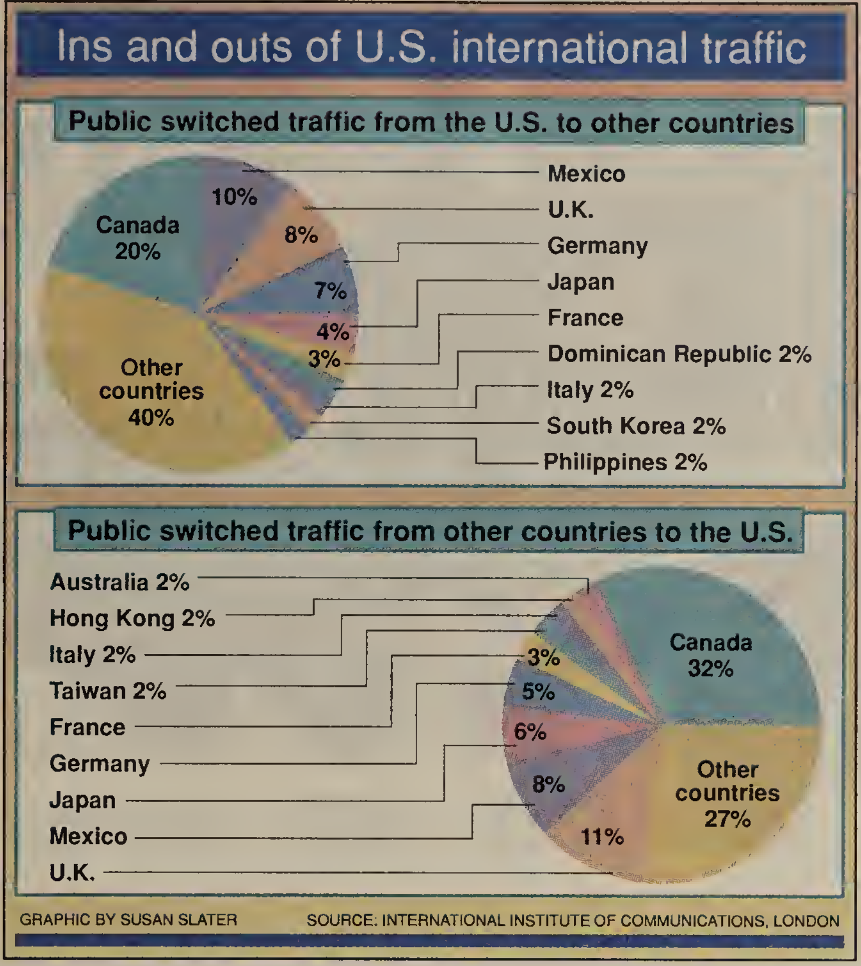
One of the cables, **Trans-Atlantic Telecommunications (TAT)-10,** is expected to be the first fiber cable linking the U.S. to Germany when it goes live in August 1992.

The largest TAT-10 ownership stakes were taken by AT&T and Deutsche Bundespost Telekom, which each bought about a fifth of the estimated $300 million cable. British Telecommunications PLC bought 13% of TAT-10, while MCI Communications Corp. purchased 9% and US Sprint Communications Co. bought 3%.

AT&T is also the largest owner of TAT-11, which is expected to link the U.S. to France and England in August 1993 and cost about $280 million. AT&T owns 32% of TAT-11; Mercury Communications, Ltd., the U.K.'s second largest carrier, bought 21%; France Telecom purchased 15%; MCI purchased 8%; and US Sprint bought 4%.

Both TAT-10 and TAT-11 will have a total capacity of 1.12G bit/sec and be configured to back each other up in case of an outage, thereby limiting reliance on satellite restoration.

Both links will consist of three 560M bit/sec pairs of fiber-optic cables, two of which will be active. This same technology is used in the TAT-9 transatlantic cable and the Trans-Pacific Cable-4. ☑



GRAPHIC BY SUSAN SLATER SOURCE: INTERNATIONAL INSTITUTE OF COMMUNICATIONS, LONDON

BT's new Syncordia unit slow to attract business

By Barton Crockett
Senior Editor

ATLANTA — Since hailing the arrival of its new Syncordia Corp. outsourcing unit this past September, British Telecommunications PLC (BT) has yet to land much business for the operation.

To date, BT has only signed up one Syncordia customer, and that user, Amadeus Global Travel Distribution, has not cut over the network that Syncordia is supposed to run. Critics scoff that Syncordia, based here, is not finding any takers because it does not have much to offer yet.

"Its absolutely been overhyped," said Leonard Elfenbein, president of Lynx Technologies, Inc., an international network consulting firm in Little Falls, N.J.

But Amadeus, a new computer reservation system owned by a consortium of major European airlines, is not one of the critics. Nigel Dye, Amadeus' network planning and design manager said he believes his company will get a good deal when Syncordia begins managing Amadeus' U.S. network in January.

Currently, SystemOne Corp. runs software in a huge data center in Miami that controls Amadeus' computer reservation services. The Miami data center is linked via multiple transatlantic private lines to Amadeus' European headquarters in Erding, Germany, which in turn is linked via Europe's largest private international E-1 net to national airline computer reservation systems across the continent.

(continued on page 60)

Sprint Int'l seeks frame relay partners

Carrier in bid to sign up European, Asian firms to offer frame relay between U.S., countries abroad.

By Barton Crockett
Senior Editor

RESTON, Va. — Sprint International, a division of US Sprint Communications Co., is negotiating with several carriers abroad to form alliances for offering international frame relay services.

Paolo Guidi, president of Sprint International here, said the carrier is talking with a number of service providers, including Cable & Wireless PLC and the Japanese carrier International Digital Communications, Inc., about teaming up to offer public frame relay service between the U.S. and the foreign carriers' home countries.

Frame relay is an emerging packet technology based on variable length frames that supports better throughput and less network delay than X.25 by handling error correction and flow control at net end points rather than at each intermediate packet node.

Guidi said the talks are still at an early stage and cautioned that foreign carriers seem less aggressive than U.S. service providers in developing plans to offer public frame relay services.

Fleshing out plans

According to Guidi, Sprint International expects to eventually forge agreements with several foreign carriers to jointly provide international frame relay services.

"We expect to have a growing number of agreements as the carriers become more familiar with the technology and as they understand the marketplace," he said.

Guidi's comments came during an interview in which he fleshed out many of the strategic considerations underlying Sprint International's evolving strategy for supporting users' global network requirements. The company handles all of US Sprint's international voice and data services as well as all of the carrier's packet-switched equipment sales.

In the interview, Guidi said frame relay will be a primary component of US Sprint's increasing slate of global network services. But Sprint International has already backed off somewhat from its initial international frame relay service goals.

When US Sprint first announced plans to offer a public frame relay service, the company said it would offer the service from more than 200 nodes in the U.S., the U.K. and Japan by the third quarter of this year ("US Sprint unleashes frame relay service," *NW,* Oct. 1, 1990).

Now the service is scheduled to appear in the U.S. in December, and Sprint International is no longer specifying a date when international frame relay service will be generally available.

Guidi said he expects Sprint International to begin offering international frame relay service to at least a few users on a custom basis by the first half of 1992.

Sprint International envisions offering international frame relay service both from the carrier's own SprintNet network and gateways to foreign carriers' frame relay services, Guidi said. Foreign carriers, however, are rolling out frame relay services slower than

(continued on page 70)

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The fax mode supports EIA Class 2, CCITT V.14 and CCITT Group III fax standards.

When set for modem mode, the product offers V.32bis, V.42bis and Microcom, Inc.'s Microcom Network Protocol (MNP) Level 5 data compression.

The device also offers V.42 and MNP Levels 2 to 4 error detection and correction.

Available in January, the ViVa 14.4/FAX is priced at $899 and is backed by a five-year warranty.

Computer Peripherals, Inc., 667 Rancho Conejo Blvd., Newbury Park, Calif. 91320; (800) 854-7600.

T4 Systems rolls out upgraded fax server tool

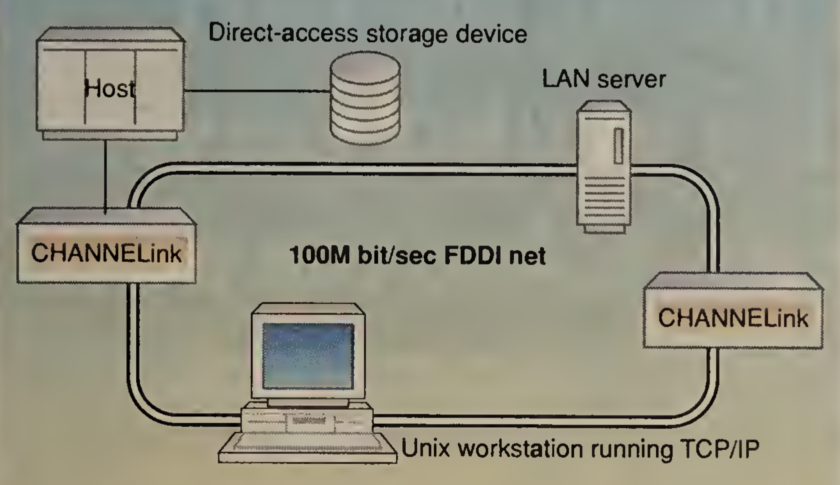
T4 Systems, Inc. recently released an enhanced version of its facsimile server software that includes an optional confirmation feature.

The software enables users of the company's **T4 Link** fax server, which emulates an industry-standard printer and lets users fax documents as if they were printing them, to specify whether they want feedback about a fax. If they select the option, they will receive an on-screen message informing them if transmission succeeded or failed.

The new version is available now and comes with each T4 Link fax server, which is priced at $16,795. The feedback option costs $1,995.

T4 Systems, Inc., 3 Innwood Circle, Suite 116, Little Rock, Ark. 72211; (501) 227-6637.

CHANNELink's FDDI interface



FDDI interface enables channel extenders to share the same ring with TCP/IP applications.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: COMPUTER TECHNOLOGY CORP., MAPLE GROVE, MINN.

Channel extender supplier unveils FDDI, HSSI links

Interfaces support disaster recovery, LAN backup.

By Joanne Cummings
Staff Writer

MAPLE GROVE, Minn. — Computer Network Technology Corp. recently announced two interfaces that connect its CHANNELink mainframe channel extenders over FDDI and High Speed Serial Interface (HSSI) nets.

The interfaces enable CHANNELink users to support new applications, such as disaster recovery and host backup of files from a Fiber Distributed Data Interface local-area network server. They also promote bandwidth sharing on high-speed wide-area network links.

The FDDI Function Module supports either single- or dual-attached station configurations.

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The company's new FDDI Function Module is a board that takes up a single slot in a CHANNELink unit, enabling the extender to be linked over an FDDI LAN to another CHANNELink unit.

The CHANNELink is essentially a stand-alone chassis that lets users extend a high-speed mainframe channel's reach over unlimited distances, a company spokesman said. Thus, the new FDDI board lets users exceed the mainframe channel's usual 400-ft limitation to link mainframes with LAN servers within an FDDI campus environment.

This provides high-speed connectivity between IBM or Cray Research, Inc. hosts, for example, and Unix-based workstations running the Transmission Control Protocol/Internet Protocol on the LAN. The spokesman said the high-speed link would enable users to easily back up their FDDI LAN file server on a mainframe-attached direct-access storage device (see graphic, this page).

The FDDI module also enables users to build high-speed fiber-optic trunks between CHANNELink extenders to extend host connectivity to other hosts or peripherals in campus environments. This is useful in disaster recovery applications in which all the data on one host needs to be transferred and duplicated on another host in the campus.

The FDDI Function Module supports either single- or dual-attached station configurations. The module also uses an optical bypass relay that removes faulty stations from the FDDI ring, enabling the net to heal itself without reconfiguration.

Pricing for the new FDDI module will be announced in the first quarter of 1992, when the product is slated to become available.

The company also unveiled a HSSI Function Module, which fits into a single slot in its CHANNELink channel extender and provides a 52M bit/sec serial interface for linking the extender with other HSSI data devices.

The HSSI module enables the CHANNELink to connect to a HSSI-based multiplexer. This allows it to share high-bandwidth facilities such as DS3, Synchronous Optical Network and Switched Multimegabit Data Service lines with multiple data devices, such as routers and switch-

(continued on page 40)

TyLink DSU/CSU can tap switched services

Avanti savior focuses strategy on access devices, will no longer provide high-end T-1 multiplexers.

By Paul Desmond
Senior Editor

NORTON, Mass. — TyLink Corp. recently announced a data service unit/channel service unit (DSU/CSU) that can be used to access either dedicated or switched digital services.

The start-up, which took over the financially troubled Avanti Communications Corp., a T-1 multiplexer and DSU/CSU maker, will support Avanti's T-1 customer base but is refocusing its business strategy to address the market for access devices and will no longer provide high-end T-1 multiplexers.

Chief among the new products announced was the Switched Network Server (SNS) 400, a DSU/CSU for dedicated digital links that can also be used to access switched digital services to accommodate peak traffic loads.

On the trunk side, the SNS 400 supports a single T-1, fractional T-1 or Integrated Services Digital Network Primary Rate Interface (PRI) link into a carrier network. Unlike other boxes, the SNS 400 can use the trunk to access both dedicated and switched carrier services simultaneously, said Jack Kelly, vice-president of marketing for the company.

On the data terminal side, the SNS 400 has four ports, which support V.35, RS-232, RS-449 or T-1 interfaces. Each port can be used to access one or more dedicated channels within the trunk.

Alternatively, a single port can use one or two 64K bit/sec channels within the trunk to establish one or two switched 56K or 64K bit/sec calls from the carrier point of presence. The two switched calls can be pooled to form one contiguous bit stream of 112K or 128K bit/sec, a rate targeted at videoconferencing applications.

Since any port can be used to access switched services, the device supports a maximum of eight switched calls, although Kelly said the most cost-effective configuration would include a mix of dedicated and switched services.

Other companies offer devices capable of using switched 56K bit/sec links to form a contiguous pool of bandwidth larger than 128K bit/sec, but they require a

(continued on page 40)

UDS Motorola announces two high-speed modems

By Joanne Cummings
Staff Writer

HUNTSVILLE, Ala. — UDS Motorola recently unveiled two new modems, a V.42bis unit that supports 38.4K bit/sec throughput and a dual modem that supports Bell 201 and 208 standards.

Both new modems can be managed by the company's GlobalView graphical network management system. GlobalView enables a net manager to centrally control a wide-area network's data communications equipment using a Microsoft Corp. Windows-based console. From the console, a manager can monitor, control and configure GlobalView-compatible modems, multiplexers, digital interfaces, Integrated Services Digital Network terminal adapters and related hardware.

The GlobalView V.3242b is a synchronous/asynchronous, full-duplex modem that can be used over two-wire dial-up or two- and four-wire leased lines. The modem uses V.42bis data compression to support a maximum throughput rate of 38.4K bit/sec. It can also automatically adjust the data rate to match the quality of the telephone line, reverting to lower speeds as the line quality demands.

GlobalView V.3242b provides automatic dialing through a Hayes Microcomputer Products, Inc.-compatible AT command set. It can hold as many as four 36-digit telephone numbers as well as configuration settings in its nonvolatile memory.

GlobalView V.3242b will be available in the first quarter of next year and is priced at $1,425.

The GlobalView Dual 208/201 modem contains two independent modems on a single card: one that is compatible with the Bell 208 standard and one that complies with the Bell 201C standard. The setup is ideal for environments that need to com-

(continued on page 40)

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*SunSoft, Inc.'s Solaris 2.0 is scheduled for release in the first half of 1992

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Supplier unveils FDDI, HSSI links

continued from page 37

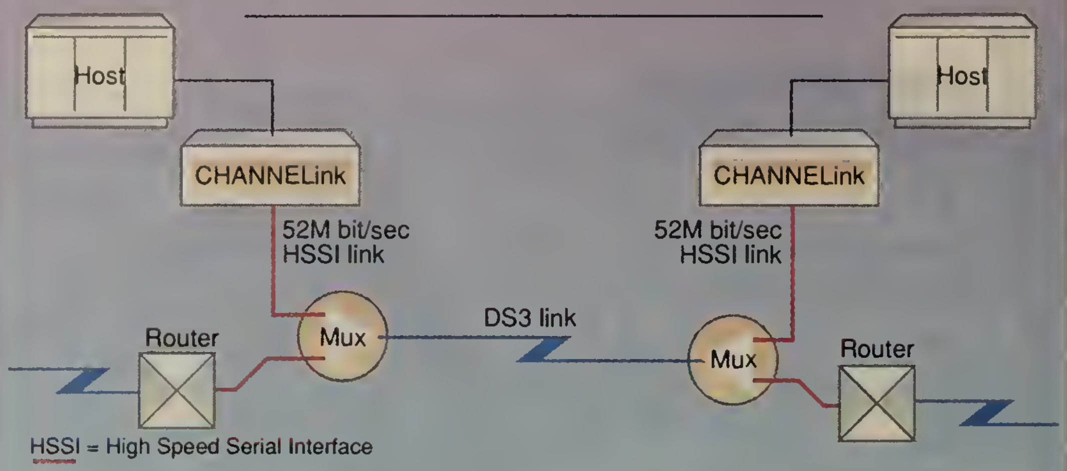
es that are also connected to the HSSI multiplexer (see graphic, this page).

For example, the spokesman said, a host tape application running at 24M bit/sec could share a 44.736M bit/sec DS3 link with other applications that use as much as 20.736M bit/sec in bandwidth.

Pricing for the HSSI module will be announced in the first quarter of next year, when the product will become available.

For more information, contact Computer Network Technology at 6500 Wedgwood Road, Maple Grove, Minn. 55369, or call (612) 550-8000.

CHANNELink's HSSI interface



New interface allows channel extender to share high-speed wide-area link bandwidth with other applications.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: COMPUTER TECHNOLOGY CORP., MAPLE GROVE, MINN.

UDS Motorola airs high-speed modems

continued from page 37

municate frequently using both standards.

The two half-duplex modems operate on two-wire dial-up or leased lines.

Each modem on the card has its own data terminal equipment and communications port, and can be hooked up with its own personal computer, UDS said.

The GlobalView Dual 208/201 modem is scheduled to be available in the first quarter of next year and is priced at $1,795.

For more information, contact UDS Motorola at 5000 Bradford Drive, Huntsville, Ala. 35805, or call (205) 430-8000.

TyLink DSU/CSU can tap switched services

continued from page 37

T-1 access line into the network that must be dedicated to the switched application.

When used with an ISDN PRI link, the SNS 400 also supports access to higher speed switched services such as switched 384K bit/sec links. Using the ISDN D-channel signaling protocol, the device can dial up a switched connection in less than one second, Kelly said. Switched calls over a T-1 link take about seven seconds each.

The choice between using T-1 and ISDN access is made in software, whereas other vendors offer separate boxes depending on which service will be employed.

"It appears to be a good product with a fairly well-defined niche in the market," said Steve Taylor, a principal at Distributed Networking Associates, a consultancy in Greensboro, N.C.

Rick Malone, a principal at the consultancy Vertical Systems Group in Dedham, Mass., said TyLink picked up the right pieces of Avanti's product line. "[Channel terminating equipment] was one area of Avanti's that did not wane when their T-1 business went down," he said.

Scheduled for availability in the fourth quarter, the SNS 400 will be priced at less than $6,000.

Among the other new TyLink products was an enhanced version of an Avanti four-port DSU/CSU multiplexer, dubbed the Open Network Server (ONS) 400. The new version consists of two T-1 data terminal equipment interfaces, which can be multiplexed onto a single T-1 or fractional T-1 wide-area link. Available now with the PBX option, the ONS 400 costs $2,750.

TyLink also announced the ONS 400E, an E-1 version of the ONS 400 that supports the 2.048M bit/sec European T-1 rate. It is available now starting at $4,495.

The company also unveiled the Frame Network Server (FNS) 400, a DSU/CSU tailored to supply access to frame relay services. Although it is no different from many other DSU/CSUs today, Kelly said the FNS 400 will be enhanced to support a frame relay packet assembler/disassembler function. It is available now, and pricing starts at $2,750.

To manage the product family, TyLink announced its Network Server Management System software, which runs on a DOS-based personal computer and supports the monitoring and controlling of TyLink's products from a central location. Available now, it is priced from $495.

For more information, contact TyLink at 10 Commerce Way, Norton, Mass. 02766, or call (508) 285-0033.

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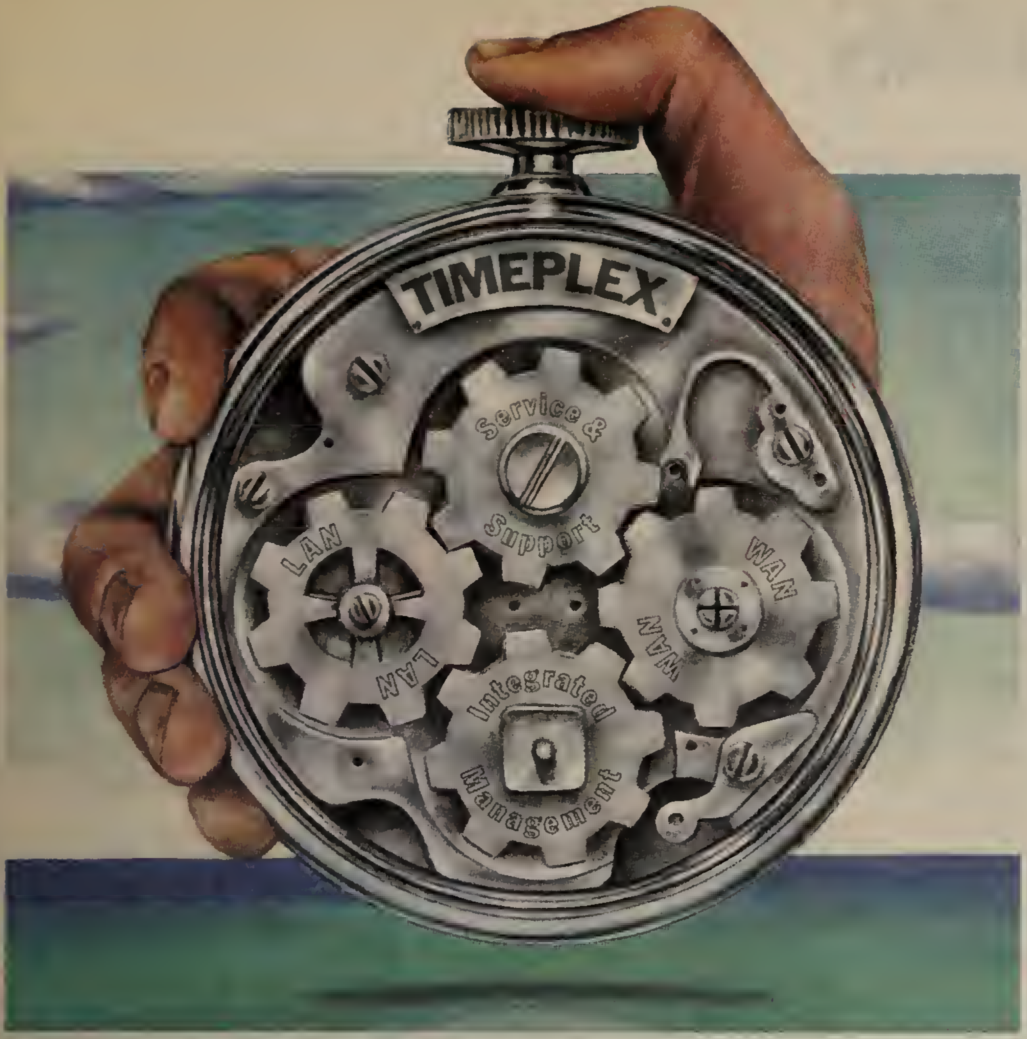

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OPINIONS

VOICE PROCESSING

BY TOM FERMAZIN

IBM product poised to alter voice processing

In an industry crowded with suppliers and products, it's difficult to see what impact one more voice processing product would have. However, the voice processing industry could experience an evolution sparked by IBM's recent introduction of DirectTalk, a Unix-based product that runs on Personal System/2 and RISC System/6000 systems, providing a platform for interactive voice response, voice-messaging and audiotex features.

A growing number of information industry sages predict that today's specialized, single-purpose computers, such as private branch exchanges, key systems, automated call distributors and voice processing systems, will soon become merely applications running on low-cost, general-purpose personal computers and workstations.

> If IBM's DirectTalk is successful, it could change the mind-set of an industry.
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If this happens, users will see lower costs because general-purpose computers manufactured in large volume would be less expensive than highly customized, proprietary platforms that are produced in small volume and available from only one source.

Also, in this environment, mixing and matching components and software from different suppliers will be easier, providing greater choice and flexibility for users. Finally, customization will be simpler because popular, widely available programs could be easily incorporated.

But could this approach apply to voice processing systems? Absolutely. In fact, a group of vendors that market their systems as personal computer-based products have promoted this concept for years: Take any old personal computer, plug in a couple of boards, add some software and, voila, you have a reasonably priced voice processing system. Unfortunately, these proponents have not sold their philosophy to AT&T, Octel Communications Corp., Rolm Co. and others, whose highly proprietary, expensive systems account for 80% of the voice processing market.

Proprietary manufacturers have traditionally contended that personal computer-based systems aren't dependable, can't grow and can't provide all the features users might want. These claims aren't true any more, but personal computer-based systems manufacturers are still expending great efforts to erase the old stereotypes from users' minds.

Now IBM has introduced DirectTalk, which consists of a personal computer, a couple of boards and some software. Sound familiar? Could this product be the mark of legitimacy for which personal computer-based systems manufacturers have been waiting? Could it send a signal to potential users that personal computer-based systems are OK?

Personal computer-based systems manufacturers may have an important ally in IBM.

More importantly, this product introduction could prove to be a critical turning point in the voice processing industry as users, faced with limited resources, look for greater value in their search for systems.

If IBM's DirectTalk is successful, it could change the mind-set of an industry. Users could find lower costs, greater capabilities for mixing and matching components and software, increased flexibility and easier customization of voice processing systems in the future. Only time will tell.

Fermazin is a senior technology analyst for Amoco Corp. in Chicago.

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EDITORIAL

Users must prepare now to leverage electronic messaging

A study released recently by the Electronic Mail Association (EMA) highlights some key issues that users must come to grips with soon.

The study was based on 2,000 interviews with executives at North American firms with revenue of more than $500 million.

Its core finding: Electronic mail usage will increase dramatically over the next five years. Its implicit message: Companies that prepare now for this rapid growth will leverage messaging technologies for a strategic edge. Those that don't will struggle to meet the snowballing needs of users and trading partners and will find themselves at a competitive disadvantage.

According to the study, nine million employees currently use E-mail at the respondent companies. By 1995, that figure may rise to 25 million users.

The study also predicts rapidly increasing international and intercompany messaging.

Network executives today must build a network architecture flexible enough to support dramatically increased messaging and interconnection with business partners.

> Companies that prepare for rapid growth will be able to leverage messaging for a strategic edge.
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Users also need to base their E-mail strategies on products and services that support open messaging standards, such as X.400 and X.500, and provide the ease of use and interconnection needed. In addition, they must address the vital issues of training and development of corporate messaging policies.

Perhaps most importantly, users need to examine ways to combine messaging with other applications to streamline processes, increase productivity and improve the way they do business with customers and suppliers. Today, users with such innovative mail-enabled applications already enjoy significant gains ("Users herald benefits of mail-enabled applications," *NW*, Nov. 4).

By exploring the intertwining of messaging and applications and by adopting an appropriate network/messaging architecture for the future, savvy users will be positioned to take advantage of one of the most significant technological opportunities of the decade.

OPINIONS

THE FUTURE OF NETWORKING

BY JAMES HERMAN

Managing six strategic net transitions in the '90s

The 1990s will be an era of fundamental change in enterprise networks. To keep on track, network managers should begin now to plan for six strategic transitions that will enable them to better apply networking to the needs of their companies.

Transition 1 involves a shift from using many separate fragmented networks to depending on an enterprisewide network utility. In the '90s, network managers must replace the fragmented network patchwork they implemented in the '80s with a single, enterprisewide utility that supports a wide variety of applications, protocols and vendors. The primary architecture for this enterprisewide utility is the local-area network-based internetwork.

Transition 2 encompasses a change from proprietary to open systems networking. The proprietary approaches implemented in the past decade must be replaced with open system standards, either the Transmission Control Protocol/Internet Protocol or Open Systems Interconnection.

Unless network managers settle on a single set of open systems protocol standards, their networks will be unable to withstand the onslaught of new technology and distributed applications.

With Transition 3, the responsibility for managing the enterprise internetwork will shift from the engineering department to production or business operations. At the same time, user companies must put in place a formal set of procedures for configuration control, testing and change control.

These changes require additional training for existing operations personnel and the promulgation of new policies. Further enhancements of the internetwork will also be needed to increase its manageability and reliability.

Transition 4 will see the responsibilities of groups within the organization shifting from telecommunications and data communications management to distributed computing services management.

The communications department must move along with the users into the next generation of computing. This means building an enterprisewide client/server architecture that delivers key network services for the next generation of client/server business applications. In most organizations, this will involve shifting responsibility for these types of services from the computer or MIS manager to the network manager.

> Designing an architecture is one thing; adhering to it is another.
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Included in Transition 5 is a migration from mostly private networking to a hybrid public/private data networking strategy. Newly introduced carrier-provided data networking services will be provisioned by using high-speed fiber-optic circuits to back haul customer traffic to remote switches equipped to handle the new service, bypassing the local telephone company switches not yet equipped for the service. This will allow carriers to offer a new service in hundreds of locations without having to provision each switching center with software and hardware for that service.

These new services will be optimized to meet the needs of LAN interconnection, which is characterized by bursty traffic patterns. Public services will offer a less expensive alternative to dedicated lines, which bursty traffic cannot use efficiently.

By mid-decade, most wide-area networking should be public, while premises networking (LANs and campus-area networking) will be private. Most router networks will be built with full mesh connectivity in the wide area because services, such as frame relay, provide a virtual channel between each pair of routers. The cumulative effect of this transition will be lower costs and less investment in private multiplexing equipment.

With Transition 6, developing and procuring networks will change from a haphazard process to one driven by architectural needs. An architecture defines standards and guidelines for future design and implementation efforts, so many different efforts can add up to a coherent and effective overall system. It defines structural guidelines that will continue to be useful over many years. An architecture brings unity, consistency and simplicity to the network.

By abstracting the general issues in managing and deploying networks, the architecture can provide guidelines that will apply to a wide range of future conditions. By concentrating on standardization of interfaces, an architecture creates and reinforces points of long-term stability.

Designing an architecture is one thing; adhering to it is another. An architecture needs the support and understanding of all parts of the information systems (IS) organization and, ideally, the net users. Following through on its implementation requires determination and commitment by IS management as well as the institution of processes that review procurements. Net managers must develop these architectural guidelines and educate their users on the value and necessity of adhering to them. ◪

Herman is a principal with Boston-based Northeast Consulting Resources, Inc., a consulting firm that focuses on information technology and strategic management.

LIKE ALLIGATORS IN A SWAMP, unforeseen problems can really put the bite on a communications operation. Many managers find themselves wrestling with these networking reptiles every day.

If you've survived an "alligator attack," share it with our readers by calling Susan Collins, associate features editor, at (508) 820-7413 or fax your idea to us at (508) 820-3467. Alligators should be 1,200 words in length and submitted either on disk or via modem.

TELETOONS

BY FRANK AND TROISE

How remarkable! It says..."Commemorating the wisdom of Ascii the First, who transferred his kingdom's records from papyrus floppies onto a central hard disk."

LETTERS

Keep a lock on 900 access

I'm writing in response to your recent column on allowing access to 900 service ("Net managers shouldn't restrict 900 number access," *NW*, Oct. 21). Saying net managers shouldn't block 900 access is like saying, "Leave the safe open with thousands of dollars lying around because someone may need petty cash to buy a stamp."

Most consultants and telecommunications managers know that calls to a specific 900 number can be allowed using toll restriction or automatic route selection while all others are denied. Finding abusers after the losses have occurred is the proverbial equivalent of locking the barn door after the horse has fled.

Telling telecommunications managers they have no responsibility for preventing fraud, as the column suggests, and that they should tell department managers they must do manually what can be done automatically is also absurd. Refusal to pay for calls to 900 numbers has gotten so bad that many carriers are now refusing to provide billing services for 900 calls. This fact alone shows a trend against legitimizing 900.

Telecommunications managers would be remiss if they did not try to block 900. We're still looking for a telecommunications manager who has made money from 900.

We have also examined the possibilities of having clients provide their services via 900 numbers. In an age when customer service may be the only business edge, the ramifications of having the customer pay for service this way must be carefully examined.

Everest Hunter
President
E.C. Hunter Associates, Inc.
Syracuse, N.Y.

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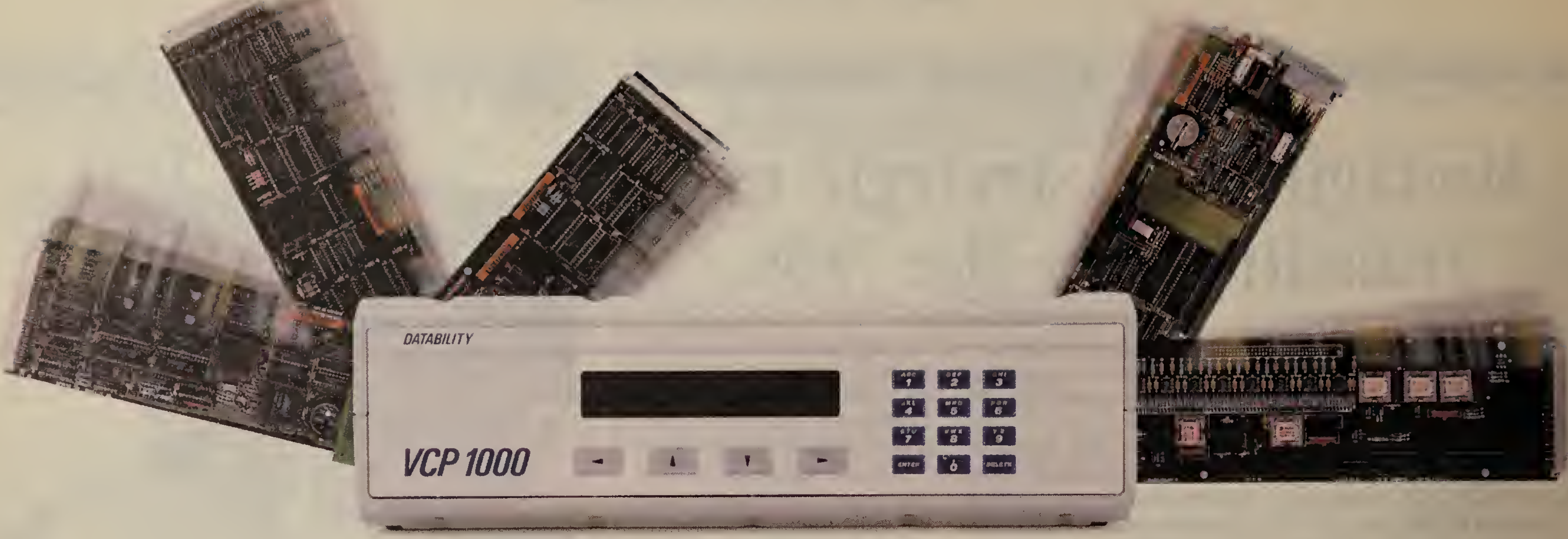

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ISDN SERVICE

Carriers strive to make ISDN more visible

CONTINUED FROM PAGE 1

Besides the distorting hype, other problems, including differing carrier implementations of signaling standards and incompatible central office switching equipment, have plagued ISDN. These matters are now being addressed by carrier and vendor standardization efforts that could lead to a bright future for the technology.

The question is, will anybody care?

While carriers and vendors were busy implementing proprietary versions of ISDN, large users established powerful private and hybrid networks using switched and dedicated services as well as commonly available equipment that provided them with most of the functionality of ISDN.

Now, with carriers proclaiming that ISDN is finally here, these large users are saying, "So what? We've already got the features we need with private branch exchanges, virtual networks and switched data services."

The International Telecommunications Users Group even released a report at the Telecom 91 Exhibition and Forum in Geneva last month that questions the need for

(continued on page 46)

Briere is president and Guptill is an associate of TeleChoice, Inc., a Montclair, N.J., telecommunications consultancy specializing in long-distance service analysis and network design. They can be reached at (201) 746-0200.

CHART • GUIDE

A Buyer's Guide chart comparing interexchange carrier ISDN services appears on page 46, while a chart comparing RBHC and BOC ISDN offerings can be found on page 52.

Will pricing incentives and the rollout of local PRI services make users notice ISDN?

Interexchange carrier ISDN services

Carrier	Service	Signaling used/ Signaling standards supported	Nonassociated D channel signaling	Services accessed	Service coverage	Installation charges	Monthly charges	Features available	PBXs tested
AT&T Business Communications Services Basking Ridge, N.J. (800) 222-0400	AT&T ISDN Primary Rate Interface (PRI service only)	Out-of-band/ CCITT7	479 non-associated B channels supported	WATS, 800, 900, virtual networks, switched data (56K, 64K, 384K and 1.536K bit/sec), international, VTNS	380 U.S. locations (includes all 114 4ESS toll switches in AT&T Worldwide Intelligent Network and 266 extended POPs)	$3,000 per D channel (waived on orders with SDDN 384 or SDS 384 through Dec. 31 and installed no later than Feb. 15)	$400 per D channel (waived for 3 months on orders placed between Sept. 5 and Oct. 20 and installed no later than Dec. 1)	Station ID, ANI delivery (extra charges apply) user-to-user information, D-channel backup (standard D-channel fees apply) channel negotiation, call-by-call setup, call-by-call service selection, alternate destination call redirection (installation charges of $1,090 per 800 number pair), static trunk group rearrangement, dialed number identification service, nonfacility associated signaling, switched 384K (installation and usage fees extra)	AT&T Definity G1 and G2, AT&T Merlin Legend, Ericsson Information Systems, Inc. MD110 R4, Fujitsu Business Communication Systems OMNI, Fujitsu F9600, Hitachi America, Ltd. HCX5000, InteCom, Inc. DTT24, NEC America, Inc. NEAXX2400, Northern Telecom, Inc. SL-1, Rolm Co. 9751 amd 9757, Siemens Private Communications Systems, Inc. Saturn IIe
MCI Communications Corp. Washington, D.C. (800) 888-0800	MCI ISDN (PRI service only)	Out-of-band/ CCITT7, ANSI SS7	479 non-associated B channels (20 T-1s) supported	WATS, 800, 900, virtual network, switched data, private line	306 U.S. locations; 440 total POPs	$3,000 (waived through Dec. 31)	$400 per D channel	Station ID, ANI delivery, D-channel backup, call-by-call setup, trunk group rearrangement, call-by-call service selection	AT&T Definity G1 and G2, Northern Telecom SL-1, Northern Telecom SL-100, Rockwell International Corp Galaxy, Rolm 9751, Siemens Saturn IIe
US Sprint Communications Co. Kansas City, Mo. (800) 877-6584	Sprint ISDN (PRI service only)	Out-of-band; Northern Telecom, Inc.'s A211-4 (based on CCITT7)	479 non-associated B channels supported	WATS, 800, private line, international	All major U.S cities; 290 total POPs	$2,000 per D channel (waived through Dec. 31)	$300 per D channel	Station ID, ANI delivery, D-channel backup, channel negotiation, call-by-call setup, trunk group rearrangement, call-by-call service selection	AT&T Definity G2, InteCom 1/92, Northern Telecom SL-1, Northern Telecom SL-100, Rockwell Galaxy, Rolm 9757, Siemens Saturn IIe

POP = Point of presence
PRI = Primary Rate Interface
SDDN = Software-Defined Data Network
SDS = Switched Digital Services
SS7 = Signaling System 7
VTNS =Virtual Telecommunications Network Service

SOURCE: TELECHOICE, INC., MONTCLAIR, N.J.

(continued from page 45)

ISDN, given the advances made in switched services and customer premises equipment in the past few years and the well-publicized problems in linking different carriers' ISDN implementations.

As a result, carriers find their long-awaited ISDN offerings aren't in such demand anymore. Some have even changed marketing strategies, for example, shifting their focus from larger user firms to smaller ones.

In order to counter the current lackadaisical attitude that users have toward ISDN, the carriers hit on the most enticing incentive they know — price.

Money talks

As a cost-effective alternative to standard business lines, most of the regional Bell holding companies are marketing ISDN Basic Rate Interface (BRI) service, which consists of two 64K bit/sec bearer, or B, channels and one 16K bit/sec signaling, or D, channel. According to the RBHCs, such BRI circuits cost little more than a standard business line but offer tremendously greater services and sheer transmission capacity.

One RBHC following this strategy is Ameritech. Its ISDN Direct BRI service is available to Illinois users for approximately $94.50 per line for installation and $45 per line per month.

By contrast, installation of a standard business line in Chicago runs about $85, while the monthly charge for a basic business line ranges from about $9 to $13, depending upon the area of the city and other variables.

Thus, to equal the bearer capability of a BRI link, a customer would have to install two standard business lines — boosting the monthly charges to between $18 and $26. Although that's still less than the $45 monthly fee for a BRI line, Ameritech claims that users get much more functionality for about a dollar a day more per line.

Other RBHC ISDN services are available at similar prices (see chart, page 52).

The three major interexchange carriers — AT&T, MCI Communications Corp. and US Sprint Communications Co. — are pushing Primary Rate Interface (PRI) connections instead of BRI alternatives, largely because their big customers are installing ISDN for high-volume applications. These carriers are offering fee waiver promotions, which eliminate the rather costly installation fees for ISDN PRI lines (usually about $3,000 per PRI line) in return for service orders.

The interexchange carriers hope the reduction in cost will spur users to finally install and use these top-shelf voice and data services.

AT&T is waiving its $3,000 installation charge for those who order ISDN PRI access to its 384K bit/sec Software-Defined Data Network service or its 384K bit/sec Switched Digital Services by Dec. 31. The PRI must be in-

(continued on page 48)

Carriers attempt to bridge ISDN islands

One of the major roadblocks to Integrated Services Digital Network's popularity among users is that carriers have built incompatible islands of ISDN. Establishing an end-to-end ISDN connection over local and long-haul carrier facilities has been difficult because carriers have differing implementations of emerging Signaling System 7 (SS7) standards.

Most users are familiar with SS7 but may not know there are two major SS7 standards that carriers are implementing differently. SS7 is an out-of-band signaling system and protocol that provides the network switching intelligence needed to support many ISDN offerings.

Incomplete specifications and differing interpretations of ANSI's and CCITT's SS7 standards left enough room for carriers and carrier equipment makers to build differing implementations of SS7.

While both sets of protocols perform similar functions, the design of the message packet in each differs. This means that information appears in different places in the data stream of the packets and equipment that can read one type of message cannot read the other without special interface programming.

There are other, more minor differences in various carriers' implementations. In some cases, to make interconnection easier, carriers have implemented portions of both standards, creating their own version of SS7.

To overcome signaling and other more subtle differences in ISDN implementations, regional Bell holding companies, ISDN equipment vendors and interexchange carriers are working together on a project called National ISDN 1.

National ISDN 1 is the first major step in creating a set of national ISDN interoperability standards based on Bell Communications Research technical recommendations and implementation agreements between each vendor and carrier. The end result should be a set of standard ISDN Basic Rate Interface (BRI) implementations that will enable carriers to interconnect ISDN BRI islands and bring end-to-end ISDN to more users.

Work in developing National ISDN 1 took a major step forward last February, when industry leaders agreed to develop and implement standard ISDN services and equipment by February 1992. This agreement — Phase One of National ISDN 1 — was a result of numerous requests by ISDN users, including great pressure from the North American ISDN Users' Forum.

A second project to link RBHC BRI and Primary Rate Interface (PRI) islands with interexchange carrier PRI services — National ISDN 2 — is on the drawing board.

The participants in National ISDN 1 include the top names in both computers and communications: Apple Computer, Inc., AT&T, Digital Equipment Corp., IBM, Northern Telecom, Inc., Siemens Stromberg-Carlson, all seven RBHCs and Bell Communications Research.

The development and implementation of Phase One is being overseen by the Corporation for Open Systems International. The heart of National ISDN 1 is 50 technical references that describe how ISDN services and capabilities are to be implemented. Bellcore developed the technical specifications in cooperation with the vendor and carrier participants.

The desired result of National ISDN 1 is not just the availability of end-to-end ISDN, but the development of a standardized set of protocols that will allow manufacturers to mass-produce carrier and customer premises equipment. Mass production makes it possible for vendors to provide service ubiquity and lower prices to users.

Bell Atlantic Corp. is scheduled to roll out in March 1992 the first implementation of National ISDN 1 on its Northern Telecom central office switches. However, the cutover may occur earlier, company sources say.

The implementation won't initially affect commercially available ISDN services, however. It will be a test of the switch and protocol capabilities. Rollout of National ISDN 1 protocols to ISDN services over the carrier's public network will probably occur no earlier than the third quarter of 1992.

— Daniel Briere and Bruce Guptill

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(continued from page 46)

stalled no later than Feb. 15.

AT&T also waived the $400 monthly PRI fee on orders placed before Oct. 20 and installed no later than Dec. 1.

Similarly, US Sprint is waiving the installation fee on its ISDN D-channel service through Dec. 9. And for an unspecified period, MCI is waiving its PRI installation fee of $3,000.

For an indefinite period of time, MCI is also waiving the $250 installation fee associated with call-by-call service configuration, which enables users to route the multiple calls transmitted to a carrier over a single PRI line to different locations, and the $300 installation fee for automatic number identification (ANI), which delivers calling number information to called parties. For other information on interexchange carrier ISDN services, see the chart on page 46.

Unfortunately, none of the RBHCs are currently offering waivers. In fact, the pricing for RBHC services differ, depending on the state tariffs within their operating regions. Because of this, the charges for RBHC services shown in the charts are approximate.

Three of these carriers — Bell Atlantic Corp., Southwestern Bell Corp. and US West, Inc. — only offer ISDN on a case-by-case basis and, therefore, did not provide pricing information for the charts.

Of course, ISDN provides more than just current carrier cost incentives. Indeed, ISDN offers exceptional value in communications connectivity, including the integration of voice, data, image and video over a single interface to the desktop as well as a broad range of call-by-call management options.

ISDN offers exceptional value in communications connectivity.

▲▲▲

Combining efficiencies in call setup time and call handling capabilities with ISDN — due mostly to the out-of-band signaling used with ISDN — users with telemarketing operations, for instance, can save 10 to 20 seconds per call, depending on the application, customer premises equipment and network capabilities employed.

But even at a few seconds per call, when multiplied by the several thousands or even millions of calls handled by some users per year, the savings add up. In addition, the improved call setup and handling capabilities can help users process more calls in less time, thus increasing revenue opportunities.

New this year

To bolster the attractiveness of ISDN services, both the interexchange carriers and RBHCs have announced several new or enhanced ISDN service capabilities.

One area of improvement is D-channel backup, which enables customers using multiple PRI access lines to designate a second D channel to handle call signaling should the primary D channel fail. Typically, if a customer has multiple PRI trunks running into a single PBX, there is only one D channel active to control those PRI lines at any particular time.

MCI and US Sprint recently announced the availability of a D-channel backup service, while AT&T has offered a service since January 1990.

The big news among RBHCs is the availability of ISDN PRI service to complement the present BRI offerings.

Historically, the RBHCs have attempted to migrate their Centrex users to ISDN first.

After all, Centrex users — and extensive users of virtual networks or any of the dial-up digital services now available from regional and local carriers for that matter — will be among the first to move to ISDN. This is because they are the most familiar with what dial-up digital connectivity can do as well as the features that are available through an intelligent network switching system.

Some of the regional carriers are offering initial ISDN services only to Centrex customers, thereby limiting overall market acceptance of ISDN.

Southwestern Bell's Plexar with ISDN service is available only to Centrex users, as is Bell Atlantic's IntelliLinQ BRI service. Pacific Bell, US West and Ameritech all offer ISDN to Centrex and standard business-line users.

Ameritech became the first RBHC to roll out ISDN PRI when it unveiled its non-Centrex-based ISDN Prime PRI service earlier this year. Although ISDN Prime is currently only available to customers of Ameritech's Illinois Bell Telephone Co., Ameritech is now filing tariffs to make the service available to customers in the other regions it serves next year.

Other RBHCs are following suit. BellSouth Corp. is filing PRI tariffs in one or more of its service areas later this year, as is Southwestern Bell.

In late 1990, AT&T announced an ISDN/Centrex PRI service called Primary Rate Interface Nodal/Centrex Express (PRINCE). PRINCE allows users of Centrex services provided through an AT&T 5ESS switch to receive PRI features using an AT&T 4ESS switch. This effectively links the AT&T interexchange service with local services based on the carrier's switches.

Such features include ANI, call-by-call service selection, alternate destination call redirection and access to other AT&T do-

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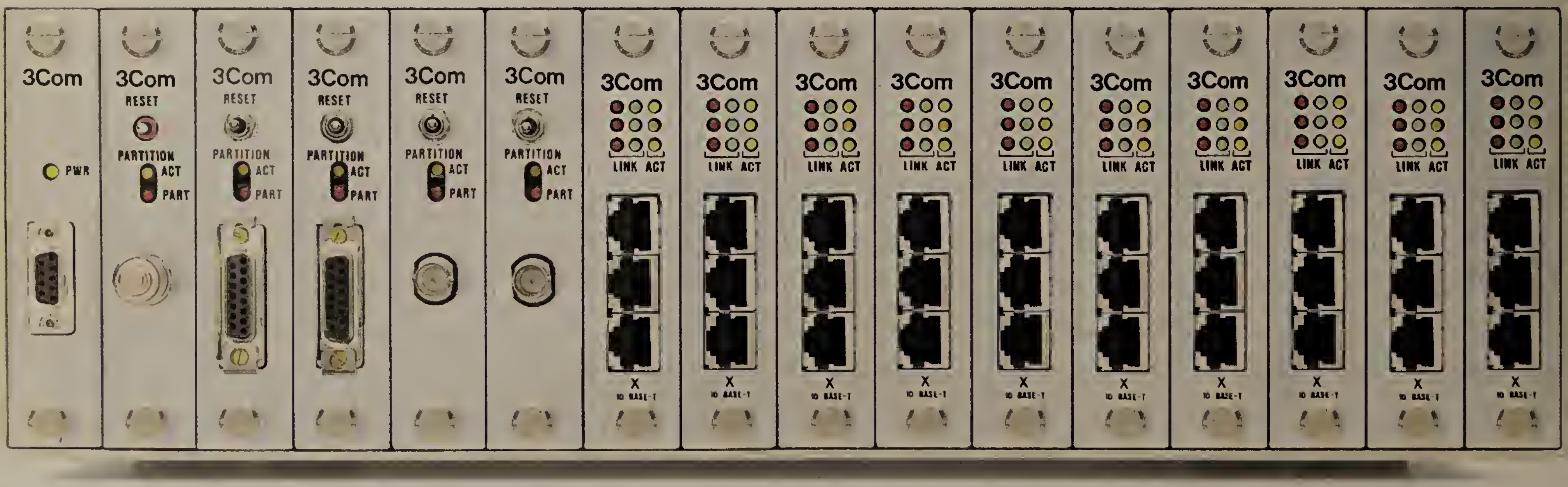

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mestic switched services.

There have been other Bell operating company-related developments as well. Nynex Corp., serving New York and New England, this year unveiled ISDN-based circuit-switched voice and data services, packet-switched voice and data services, electronic telephone services, X.25 and ANI display.

While such services are not new on an individual basis, Nynex is incorporating them all into its ISDN offering.

Problems, problems

The development of PRI services by the RBHCs will remove a major stumbling block to the development and implementation of a widespread, national ISDN service. Technically, ISDN PRI is ubiquitous since all the major interexchange carriers offer PRI service throughout their nets.

But the integration of local BRI loops with long-distance PRI has been lacking. For the most part, users have had to acquire a local carrier T-1 circuit and use PRI interfaces on customer premises equipment to access long-haul PRI service.

The result has been nonintegrated ISDN, which is a contradiction in terms and a principal source of user dissatisfaction with ISDN. Carriers and equipment manufacturers are currently making a major effort to solve these problems through a movement called National ISDN 1.

There have also been some worrisome incompatibilities in the ways different carriers provide ISDN. The basic services are not different since carriers offer BRIs with the standard two 64K bit/sec B channels and single 16K bit/sec D channel, called 2B+D, and PRIs with the standard 23 64K bit/sec B channels and single 64K bit/sec D channel, called 23B+D. Carriers, however, are using various implementations of Signaling System 7 to operate their underlying intelligent nets (see "Carriers attempt to bridge ISDN islands," page 46).

When local and long-haul carriers finally overcome these signaling and implementation differences, users will be able to unplug an ISDN terminal from a port in a building in one state, plug it into a port in a building in another state and have it function effectively, much like they can use almost any telephone today.

ISDN applications

Portability of ISDN equipment will likely please the typical ISDN customer, who is using the service for a combination of reasons and applications.

"The majority of our customers are interested in calling number identification in conjunction with the high-speed transport," says Patricia Kuuskvere, MCI's ISDN product manager.

> There have been some incompatibilities in the ways different carriers provide ISDN.
>
> ▲▲▲

In addition, Kuuskvere says users subscribe to ISDN to quickly capture call information and gain trunking efficiencies by integrated access to voice and data services over a single PRI.

According to Tom Carroll, US Sprint group manager for ISDN product development, "The majority of Sprint ISDN customers are using the Primary Rate Interface to take advantage of the integration capabilities of ISDN."

Users also want to take advantage of the decreased call setup times, calling-line identification and Virtual Private Network/PBX interworking capabilities of ISDN, Carroll says.

David Rogers, a spokesman for BellSouth Telecommunications, says, "Our customers are using ISDN for information access in general — integrated voice and data at the desktop, image transport and videoconferencing, asynchronous host access, LAN-to-LAN connections and combinations of these applications."

As noted previously, most of the functionality available to ISDN users is already available to large users via hybrid public/private networks. Virtual network services, Centrex offerings, switched digital services and advanced customer premises equipment combine to provide ISDN-like functionality for many user applications.

However, such features and services are rarely integrated to the extent that is possible by using ISDN. ISDN is not a service in itself; it is a group of services delivered via standardized technology in a way that makes the individual services available everywhere the user needs them.

If users approach ISDN as a carrier service to support a particular application, then ISDN will almost always lose out to a service that was specifically designed or configured for that application.

Users looking for a simple point-to-point data link, for example, don't need ISDN for that and shouldn't even consider the technology for that application alone.

But if users look at ISDN as a network technology that can integrate most or all of their applications, it makes sense.

The standardized, flexible, high-speed connectivity between all points on the network, combined with the tremendous network and call management features available through out-of-band signaling, make ISDN a useful solution.

The work being accomplished by carriers, vendors and stan-

(continued on page 52)

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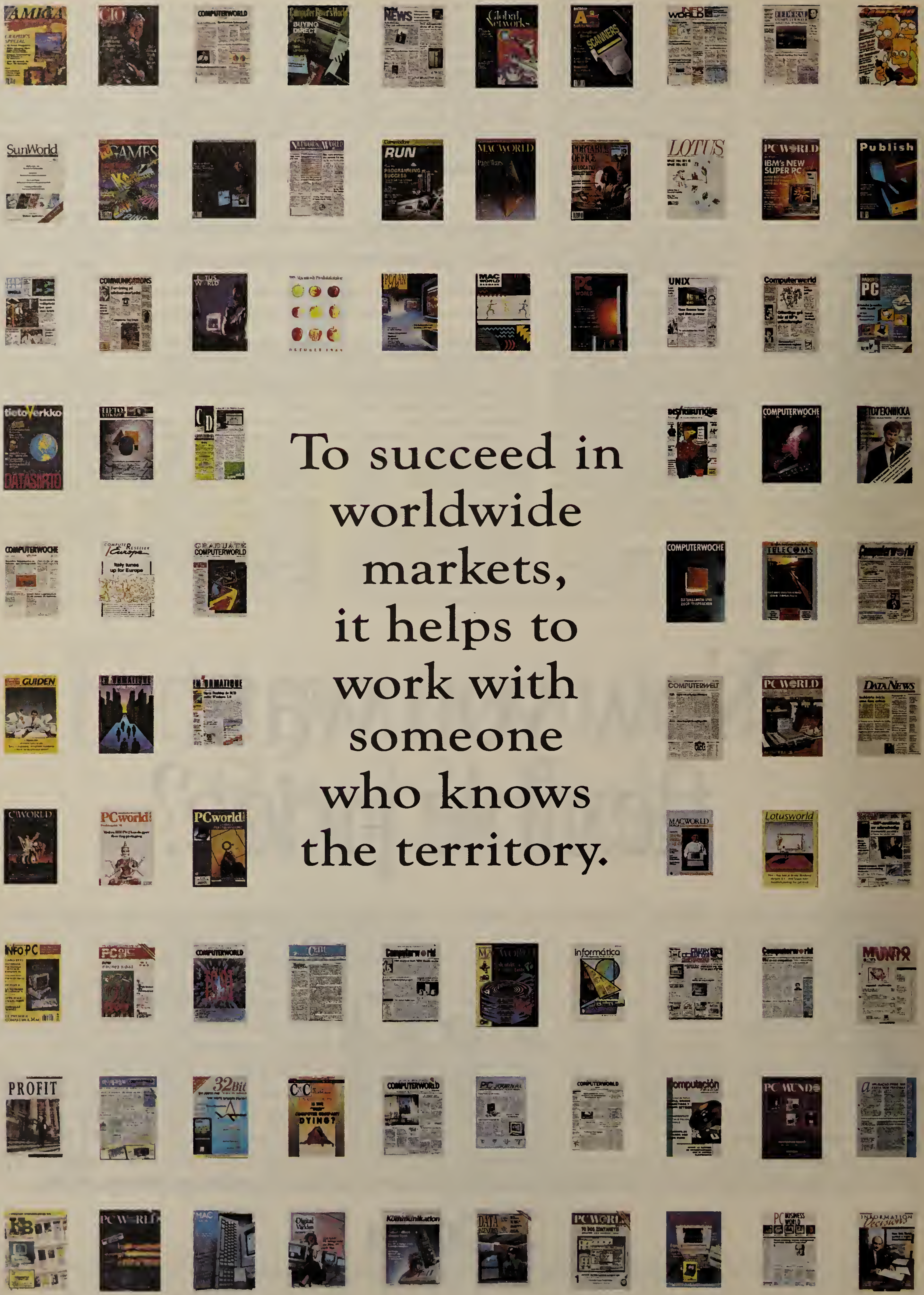

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NETWORK WORLD

Local Bell company ISDN offerings

Company	Service	Availability	Interface/ Signaling systems used	Coverage	Installation charges	Monthly charges	Circuit-switched voice features	Circuit-switched data features	Packet-switched data features
Ameritech Chicago (800) 242-8580	Ameritech ISDN Centrex	Centrex and business line users (tariffed in Illinois, Michigan and Ohio)	BRI/Out-of-band; CCITT7, ANSI SS7	Selected offices in major metropolitan areas	Approximately $250 (varies by local tariff)	Approximately $29 (varies by local tariff)	Incoming line ID (intercom only), outgoing line ID (intercom only), time and date display, call review, multiple directory number, shared directory number, privacy, calling number ID block, ISDN intercom	Speed calling, semi-restricted, fully restricted, intercom dialing, circuit-switched data call hunting	Single logical channel, fast select initiate/accept, flow control parameter negotiation, throughput class negotiation, incoming calls barred, outgoing calls barred
	Ameritech ISDN Direct	Business line customers only (tariffed in Illinois only)	BRI/Out-of-band; CCITT7, ANSI SS7	Selected offices in major metropolitan areas	Approximately $94.50 (varies by local tariff)	Approximately $45 (varies by local tariff)	Time and date display, call review, multiple directory number, shared directory number, privacy	Speed calling, semi-restricted, fully restricted, intercom dialing, circuit-switched data call hunting	Single logical channel, fast select initiate/accept, flow control parameter negotiation, throughput class negotiation, incoming calls barred, outgoing calls barred
	Ameritech ISDN Prime	Business line customers only (tariffed in Illinois only)	PRI/Out-of-band; CCITT7, ANSI SS7	Selected offices in major metropolitan areas	Approximately $4,000 (varies by local tariff)	Approximately $350 (varies by local tariff)	Time and date display, call review, multiple directory number, shared directory number, privacy	Speed calling, semi-restricted, fully restricted, intercom dialing, circuit-switched data call hunting	Single logical channel, fast select initiate/accept, flow control parameter negotiation, throughput class negotiation, incoming calls barred, outgoing calls barred
Bell Atlantic Corp. Philadelphia Contact local representative	IntelliLinQ BRI	Centrex users only	BRI/Out-of-band; CCITT7, ANSI SS7	Regionwide custom offering	Individual-case basis	Individual-case basis	Incoming line ID, outgoing line ID, time and date display, call review, multiple directory number, shared directory number, privacy, calling number ID block, ISDN intercom	Speed calling, semi-restricted, fully restricted, intercom dialing, circuit-switched data call hunting	Single logical channel, fast select initiate/accept, flow control parameter negotiation, throughput class negotiation, incoming calls barred, outgoing calls barred
BellSouth Telecommunications Atlanta Contact local representative	ESSX ISDN Service (BRI)	Centrex users only	BRI/Out-of-band; CCITT7	Selected offices in major metropolitan areas (tariffs currently in effect in Alabama, Florida and Mississippi)	Varies by state and service configuration	Varies by state and service configuration	Incoming line ID, multiple directory number, shared directory number, privacy, ISDN intercom	Circuit-switched data call hunting	Flow control parameter negotiation, throughput class negotiation, incoming calls barred, outgoing calls barred
Nynex Corp. White Plains, N.Y. (914) 683-3365	Nynex ISDN Basic Exchange Service	Centrex, business and residential users	BRI/Out-of-band; CCITT7	20 cities	Individual-case basis	Individual-case basis	Incoming line ID (within user group only), outgoing line ID, time and date display, call review, ISDN intercom, multiple directory number, shared directory number, privacy	Speed calling, intercom dialing, circuit-switched data call hunting	Single logical channel, fast select initiate/accept, flow control parameter negotiation, throughput class negotiation, incoming calls barred, outgoing calls barred
Pacific Bell San Ramon, Calif. Contact local representative	ISDN Centrex IS	Centrex, business and residential users	BRI, PRI/ Out-of-band; CCITT7, ANSI SS7	20 cities; 60 total wire centers (switches)	BRI: $150; PRI: $1,500	Feature Package A (1 B channel): $17.50; Feature Package B (1 B and D channel): $26.50; Feature Package C (2 B and D channels): $29.50	Incoming line ID, outgoing line ID, time and date display, call review, multiple directory number, shared directory number, privacy, calling number ID block, ISDN intercom	Speed calling, semi-restricted, fully restricted, intercom dialing, circuit-switched data call hunting	Single logical channel, fast select initiate/accept, flow control parameter negotiation, throughput class negotiation, incoming calls barred, outgoing calls barred (optional multipoint passive bus, B channel packet)
Southwestern Bell Telephone Co. St. Louis (314) 235-9553	Plexar with ISDN	Centrex users	BRI/Out-of-band; CCITT7, ANSI SS7	14 cities	Customer-specific proposals	Customer-specific proposals	Incoming line ID (intragroup only), outgoing line ID, time and date display, call review, multiple directory number, shared directory number, privacy, calling number ID block, ISDN intercom	Speed calling, semi-restricted, fully restricted, intercom dialing, circuit-switched data call hunting	Fast select initiate/accept, throughput class negotiation, outgoing calls barred
US West Communications, Inc. Denver Contact local representative	ISDN Basic Rate Service, Primary Rate Service	Centrex users, business line users	PRI, BRI/ Out-of-band; CCITT7	11 states	Individual-case basis	Individual-case basis	Incoming line ID, outgoing line ID, time and date display, call review, multiple directory number, shared directory number, privacy, calling number ID block (pending SS7 trunks), ISDN intercom; various Centrex features	Speed calling, semi-restricted, fully restricted, intercom dialing, circuit-switched data call hunting	Single logical carrier, fast select initiate/accept, throughput class negotiation, outgoing calls barred, closed user groups, hunt groups, intercom addressing, permanent virtual circuits, reverse charge, reverse charge acceptance

BRI = Basic Rate Interface
PRI = Primary Rate Interface
SS7 = Signaling System 7

SOURCE: TELECHOICE INC., MONTCLAIR, N.J.

(continued from page 49)

dards bodies is finally bringing ubiquitous, plug-and-play ISDN to the marketplace. Here are some of the questions users should be asking about ISDN:

- Do we need ISDN capabilities and features? Firms that plan to make use of groupware, desktop conferencing, videoconferencing and traditional voice and data connectivity probably could benefit from ISDN. Firms looking for faster call setup times, improved call switching, and increased call monitoring and management capabilities should think about ISDN as well.
- Are there users within the corporation who need the high bandwidth of ISDN? End users working on local-area networks, especially those using image files (computer-aided design and manufacturing, desktop conferencing using groupware and large document or data production groups), will need at least one ISDN BRI link.
- How many such groups exist in your company now? How many will exist in two or three years? Will there be enough to cost-justify ISDN lines from your carrier at current prices? Only an analysis of your needs and the prices of local and long-haul ISDN service will provide the answer.
- How many individuals will need ISDN? While it may sound farfetched at first to have a single user needing ISDN, it seems much more likely after some reflection. Do you have telecommuters working at home or outside the office for long periods of time? If so, do these people need features such as remote call forwarding and data links to a central host or the corporate backbone? ISDN may be able to provide these features cost-effectively.
- Can users at your site or remote locations benefit from screening, ANI or other ISDN call management features? Do they use graphics or image files in their work? Do you need to provide links between them and several corporate sites or customer sites? In other words, some individual users may need ISDN.
- Perhaps the biggest question for managers is, can you prepare your users for ISDN? ISDN brings with it tremendous connectivity and features. Do your users need to know about all the possible features of ISDN? Does your company have policies in place regarding ANI information?

Some of this functionality has been provided on PBX systems for some time. Centrex users and users of virtual networks are also already familiar with many basic ISDN features, such as central office-based call forwarding, custom dialing plans and ANI. Managers at firms using these services may have fewer difficulties familiarizing their users with ISDN.

And, of course, there are cost and availability considerations. What do BRI and PRI cost for your company? What services are available, and where in your area are they available?

Happy endings?

Besides price and availability, there are formidable challenges that ISDN must overcome — for instance, the barriers to end-to-end ISDN for users. Standardization does not come easily; witness the current discrepancies in the "standard" signaling systems that must be overcome. But the barriers are falling, and the near-term future looks bright for ISDN.

As the carriers continue to work with one another and with equipment vendors, ISDN costs will drop and services will become more widely available.

Costs are already down. Consider the discounts and installation fee waivers being offered by the carriers. The interexchange carriers are providing large financial incentives to entice users to buy ISDN services. RBHCs are rolling out PRI services, and BRI charges are not much higher than those for standard business lines today.

Carriers seem to be on the right track. They are making progress toward ISDN interconnectivity, and their efforts to standardize should yield plug-and-play ISDN services and customer premises equipment in 12 to 18 months. Of course, it is in their best interest to accomplish these goals. The carriers have so much invested in ISDN, they have to make sure it works. ◼

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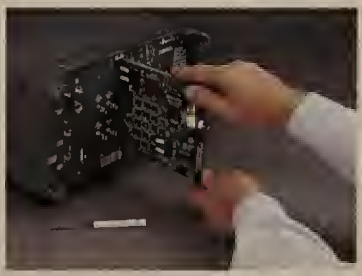

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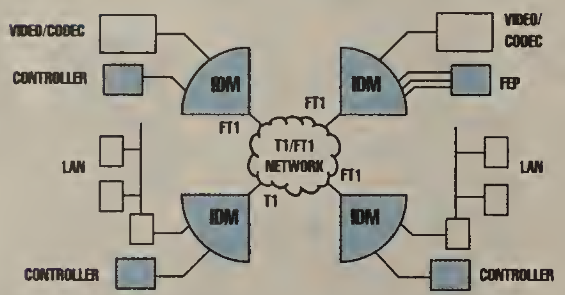

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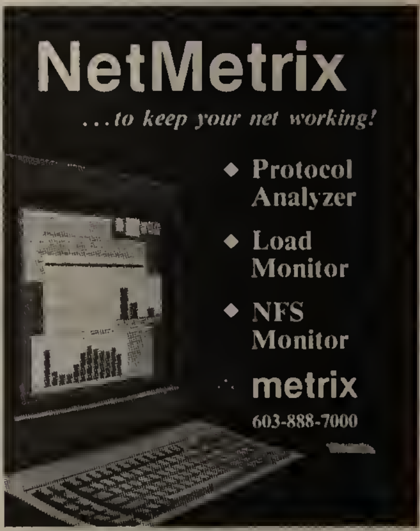

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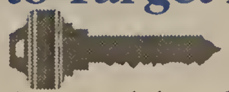

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BT's Syncordia unit slow to get business

continued from page 35

In January, Amadeus plans to shift its data processing operations to a new state-of-the-art data center in Erding that will be linked via transatlantic private lines to a Syncordia-managed network hub here. Syncordia will then design, install and manage Amadeus' entire U.S. network, which eventually will use both public, packet-switched and private-line services to link to reservation databases operated by 40 to 50 U.S. airlines, car rental agencies and hotels, Dye said.

Amadeus is using a vendor to manage the U.S. net because it believes that it cannot economically build up its own qualified staff to manage the network, Dye explained. He said Amadeus has had a good experience using facilities management services from BT and Germany's Deutsche Bundespost Telekom in Europe.

"We're assuming that Syncordia will provide equal, if not better service [in the U.S.]," he said.

Edging out competitors

BT beat out three other carriers, including AT&T and Cable & Wireless PLC, for the contract, partly because Amadeus was impressed by BT's commitment to becoming a global service provider, Dye said.

"I think the most international thing about AT&T is their advertising," he said. "They tend to be very inward looking, with America as the biggest part of the world."

Dye said if things go well in the U.S., Amadeus may let Syncordia run Amadeus' European net.

But BP Chemicals International and IBM, which Syncordia officials in September said were very interested in using Syncordia's private net management services, still haven't decided whether to sign with Syncordia. BP Chemicals is considering using Syncordia to provide pan-European net outsourcing services, according to Peter Coulling, an information systems manager at BP Chemicals' headquarters in London. IBM has expressed interest in obtaining private-line services from Syncordia in Europe. ◻

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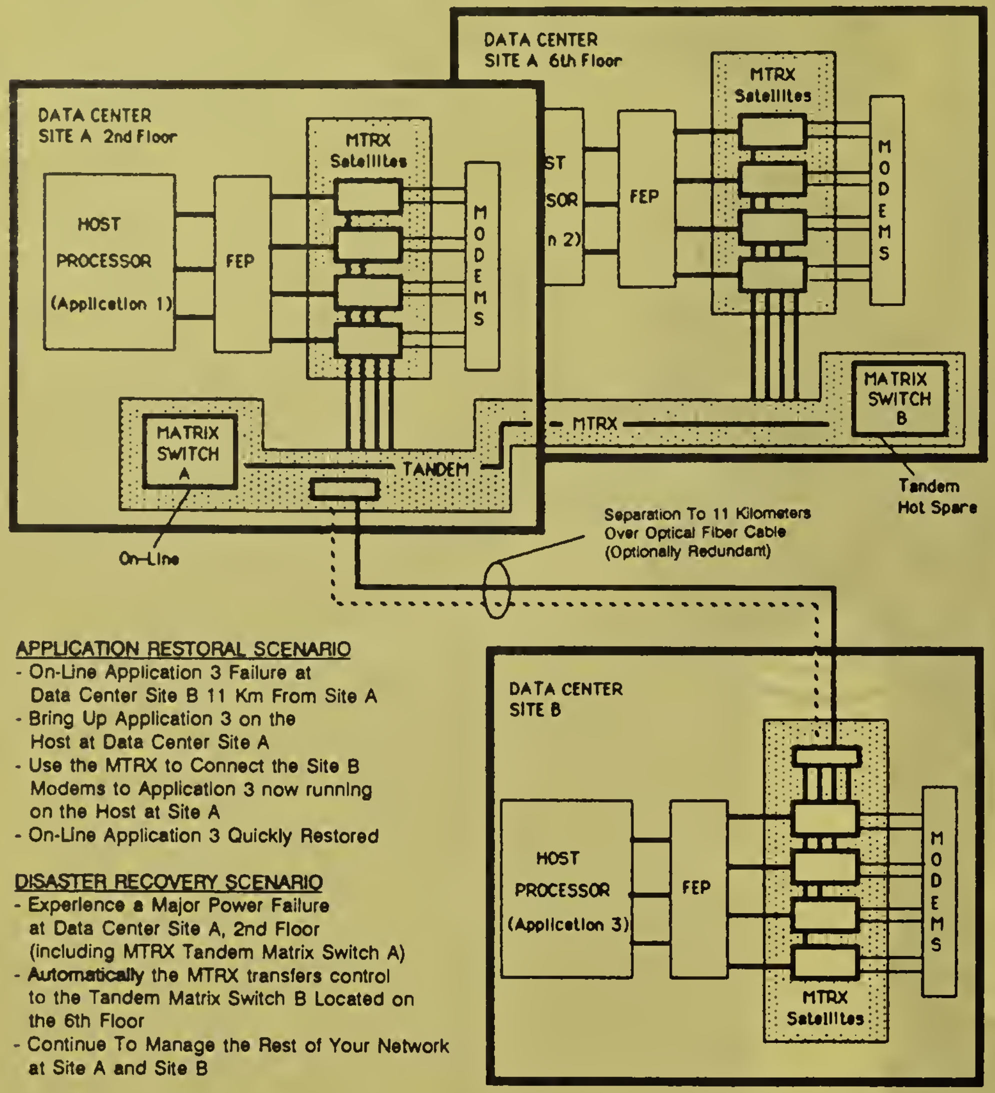
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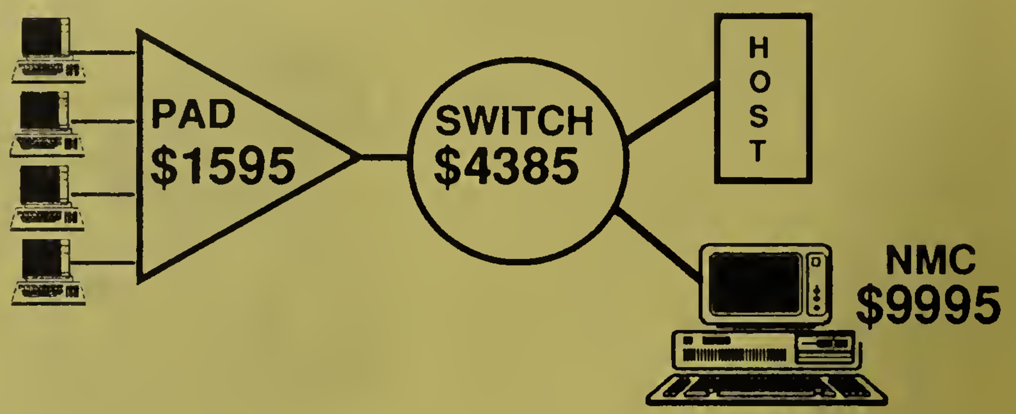

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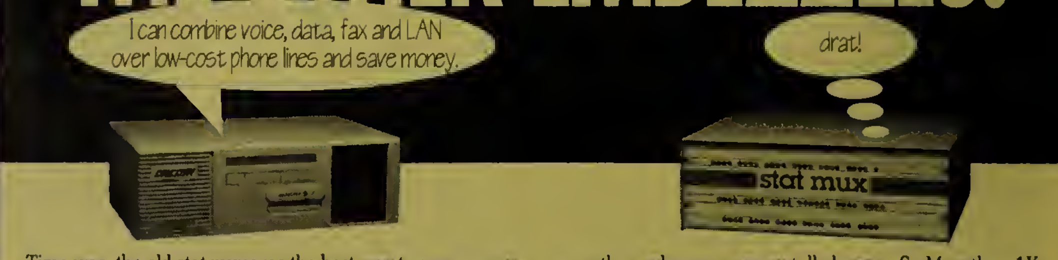
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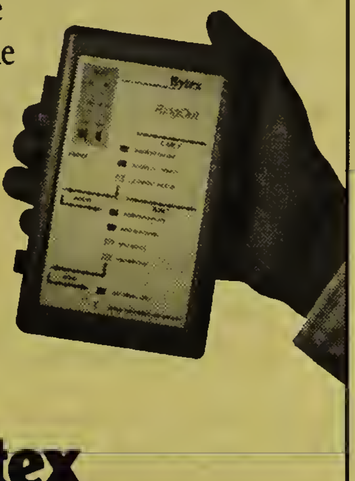

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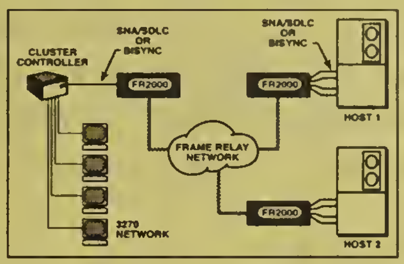

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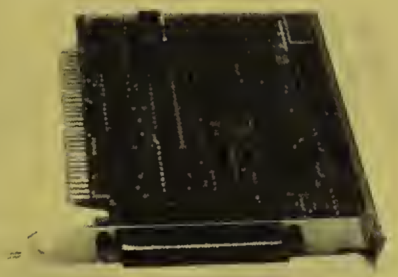

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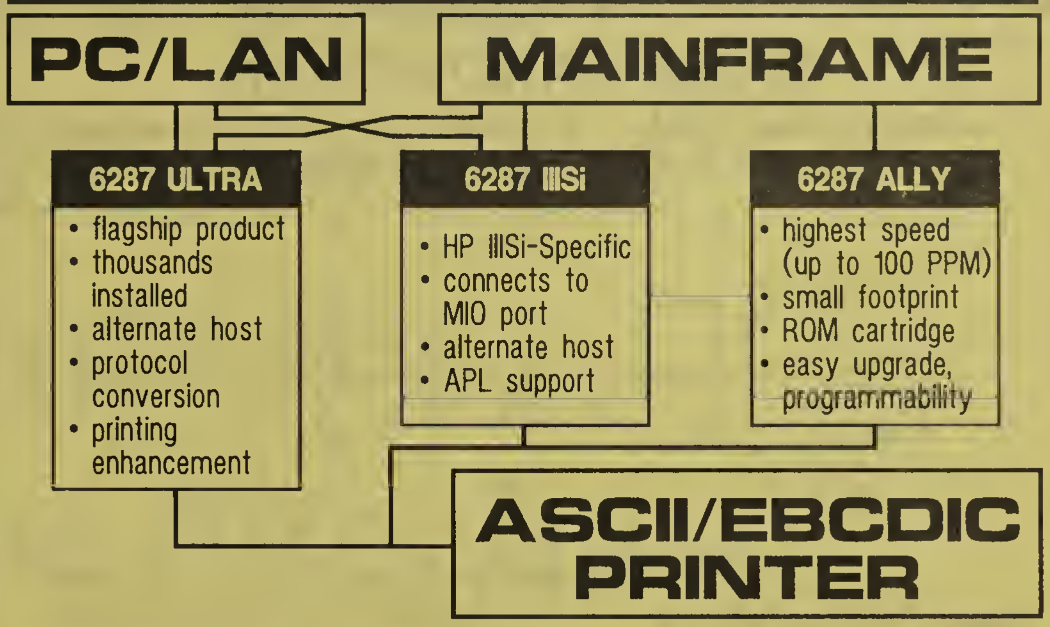

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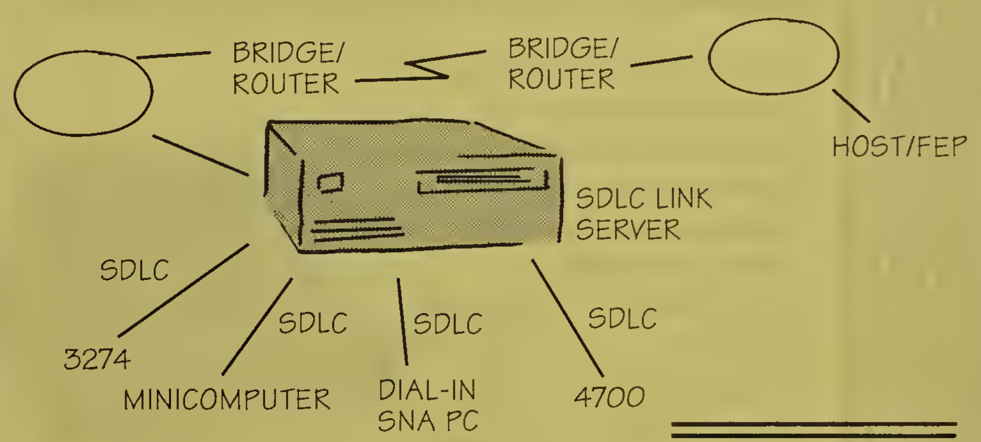

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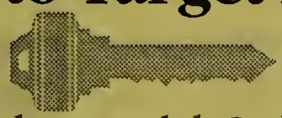

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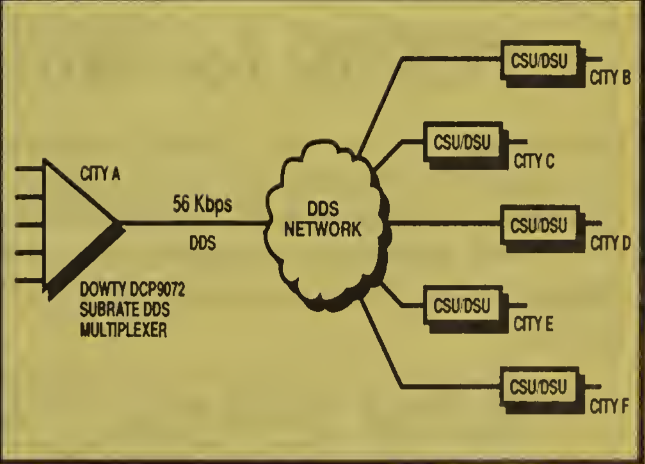

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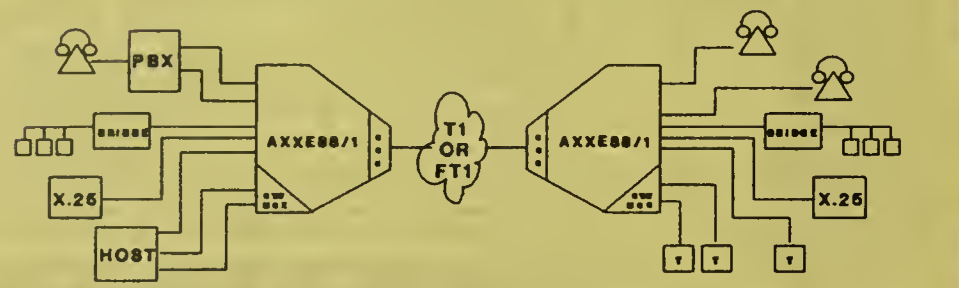

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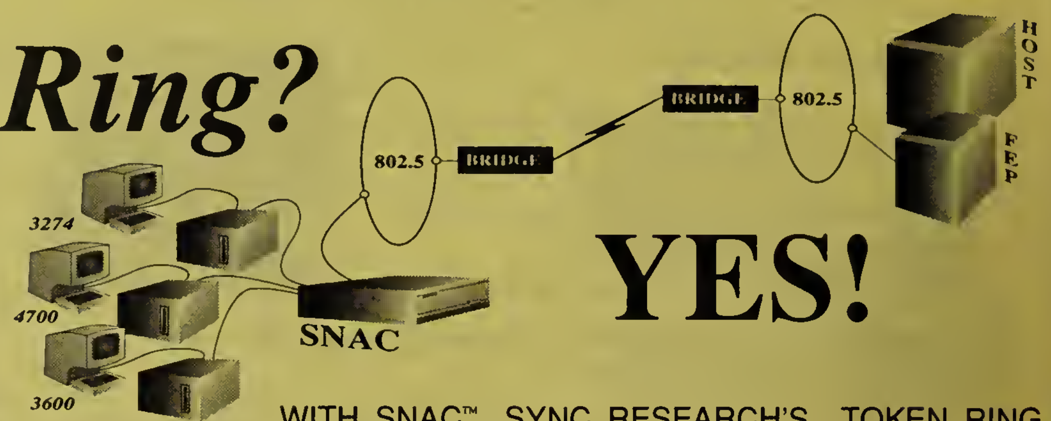

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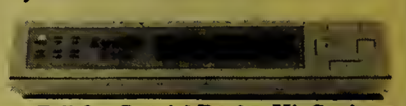

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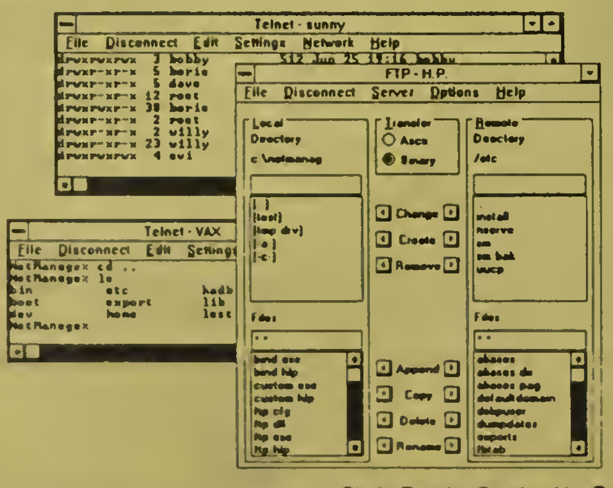

```
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drwxr-xr-x  5 horie
drwxr-xr-x  5 dave
drwxr-xr-x 12 root
drwxrwxr-x 38 horie
drwxr-xr-x  2 root
drwxr-xr-x  2 willy
drwxr-xr-x 23 willy
drwxrwxrwx  4 avi
```

```
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NETWORK WORLD

Network Innovators

by Lucie Juneau

Robert Gallager

• • • • •

His contributions to coding theory have helped make data communications faster and more reliable.

Mens et manus. Mind and hand. That's the motto of the Massachusetts Institute of Technology, and it seems to capture the essence of Robert Gallager's career.

Gallager, a professor of electrical engineering and computer science at MIT and codirector of the university's Laboratory for Information and Decision Systems, was awarded the Institute of Electrical and Electronics Engineers, Inc.'s 1990 Medal of Honor for fundamental contributions to communications coding techniques. These contributions have application in areas such as data and facsimile transmissions, electronic bulletin boards and cellular radio.

He has also written books on communications technology and has consulted for many years at Mansfield, Mass.-based data communications equipment manufacturer Codex Corp., now known as Motorola Codex.

The combination of research, writing, teaching and consulting keeps Gallager's creative mind humming. And it is the kind of balancing act on which the 60-year-old MIT professor thrives.

Gallager says his talents favor the theoretical over the practical. But a glance at his career shows he is equally at home designing a simple solution to a real-world engineering problem or pushing the frontiers of coding theory. "Few people realize that Bob is a superb engineer," says Dave Forney, a vice-president at Motorola Codex. "At MIT, he's a theorist, but at Codex, he's involved in engineering and system design. He creates elegant and outstanding engineering solutions."

> **"We're lacking a sensible idea of how to structure the networks of the future," Gallager says.**

Forney credits Gallager with reviving Codex in the early 1970s, when the company was floundering. At that time, Codex's fortunes rested on sales of a 9.6K bit/sec leased-line modem called the AE-96. Based on a pulse amplitude modulation (PAM) technique, the product was hampered by performance and reliability problems.

"Bob thought about how you would ideally build a modem," Forney says. What he came up with was a double-sideband quadrature amplitude modulation (QAM) 9.6K bit/sec modem. The QAM design enabled the modem to transmit data far more reliably than PAM because its transmission technique involved less signal distortion.

This new modem became the company's flagship product. "That was really what saved Codex," Forney says.

Typically, Gallager devotes less than one day a week to consulting at Codex and the remainder to teaching and research, a pattern common among MIT faculty members.

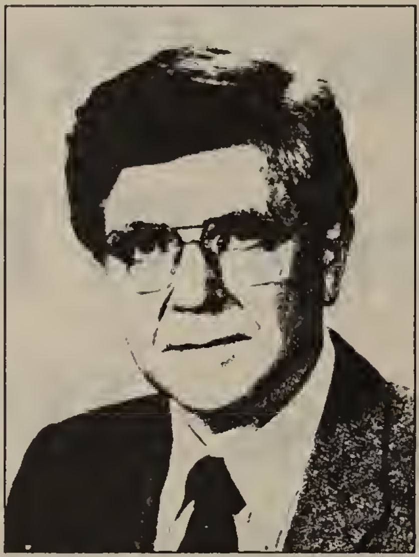
In the Army now

Ironically, Gallager owes his productive affiliation with MIT to an unwelcome turn of events. In 1953, after graduating from the University of Pennsylvania with a bachelor's degree in electrical engineering, Gallager settled into a job at AT&T Bell Laboratories and dismissed any notion of returning to school. That's when fate, disguised as Uncle Sam, intervened: In November 1954, Gallager was drafted.

The reluctant conscript soon learned that by enrolling in graduate school, he could shorten his military tour of duty by three months. "I chose to study engineering at MIT rather than mathematics at Princeton [University] because MIT started one week earlier," he says.

After earning a master's degree and doctorate in electrical engineering from MIT, he joined the university's electrical engineering and computer science department in 1956.

Landing at MIT put Gallager in the company of coding and information theory pioneers — notably, Claude Shannon, inventor of information theory, the field dedicated to understanding communications processes. Gallager was soon smitten with a fascination with coding technique.



"I started out just trying to do coding for error correction," Gallager says. Error correction techniques typically rely on the use of redundant data. By working on the coding theory behind these techniques, Gallager and other researchers discovered more sophisticated and powerful methods of correcting errors that didn't involve sending as much redundant data.

Gallager's work on error correction soon led him to investigate the underlying fundamentals of communications and information theory. His book, *Information Theory and Reliable Communication,* published in 1968, is still the standard graduate text in the field.

Gallager says he likes to concentrate on theoretical problems that have practical applications. "I usually work on a theoretical problem where I can see a reason for working on it, as opposed to a theoretical problem just motivated by mathematics," he says.

Pushing boundaries

Conversely, Gallager isn't happy unless the practical problems he's working on give him the opportunity to push the frontiers of basic theory, as he discovered in the 1970s, when he decided to delve into computer architecture for a course he was teaching.

"I was trying to understand how a computer ought to be built," Gallager says. "I couldn't find any organizing principle to center my research around. That was sort of a failure for me."

Fortunately, Gallager's work with computer architecture led to more fulfilling research in the area of computer networking. This research lead to another book, *Data Networks,* published in 1988. Gallager cowrote the book with MIT colleague Dimitri Bertsekas, a professor of electrical engineering.

MIT's preeminence in the area of data networks is largely due to Gallager's intellectual leadership, says Sanjoy Mitter, Gallager's codirector at MIT's Laboratory for Information and Decision Systems.

Much of Gallager's work has focused on simplifying the design of distributed algorithms to control network traffic. These algorithms tell the network how to route data, regulate its flow, control the underlying links and recover from a failure.

"You have to think of all the possible things that might happen," he says. "If you forget one of them, the net can deadlock."

The growing graphics capabilities of workstations and personal computers is increasing the amount of data moving over our networks, Gallager adds.

"Where we used to have relatively modest needs for sending packets of data, we're suddenly sending pictures involving enormous numbers of bits," he says. "People say a picture is worth a thousand words, but in terms of the amount of data needed to present it, it's [worth] even more than that."

How to develop architectures for very large, high-speed networks is another issue Gallager is exploring. "We're lacking a sensible idea of how to structure the networks of the future," he says. "I'm working on it. An enormous number of other people are working on it. It's a question of what networks will look like in the next 20 years."

Gallager is also focusing on multiaccess communications, which involves communications from many transmitters over a shared channel. Specifically, he is working on algorithms for making communications more robust. Examples of multiaccess systems include local-area networks and cellular radio.

Technical professionals need to keep moving on to new challenges, Gallager says. But for relaxation, the professor steers clear of problem solving. "I gave up games like chess many years ago because they're too much like the work I do," he says. ◻

Juneau is a free-lance writer based in Salem, Mass.

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DEC to unwrap Pathworks pack

continued from page 2

committed to an enterprisewide solution by offering a scalable office system. [Pathworks-Plus] is the entry into it."

Pathworks-Plus will consist of All-In-1 Mail, an existing electronic mail package that will provide a common set of messaging services to Windows-based clients in a Pathworks net.

DEC's new Pathworks services run on top of currently available versions of the Pathworks operating system on a VMS or Ultrix server. The new services include an offering the company calls an information browser, which allows users to view information in an application without downloading the application to the Windows client.

Pathworks-Plus has an electronic conferencing feature based on DEC's VAXnotes application.

Unlike E-mail, the application allows many participants to simultaneously interact during an on-line conversation.

This will augment E-mail services, which only enable one-to-one interaction.

In addition, Pathworks-Plus will include a file conversion capability that allows users to translate from one file format to another. For example, a WordPerfect Corp. WordPerfect user trying to access a document saved in Microsoft Word can have Pathworks-Plus automatically translate the document to WordPerfect format, analysts said.

DEC officials declined to comment on the unannounced products. But an agenda for this week's developers' conference obtained by *Network World* outlines two sessions on Pathworks-Plus.

In line with Phase II

The product is being viewed by analysts as a key component of DEC's All-In-1 Phase II strategy, which was announced two years ago. That strategy is intended to enable users to build an integrated, standards-compliant distributed office system of networked applications, using the desktop of their choice, with backward compatibility to existing office environments.

Analysts said the announcement is a sign of a stronger bond between the two vendors.

"DEC and Microsoft are getting closer together," said Frank Michnoff, an analyst with the META Group in Westport, Conn. "They're pushing forward the Windows client strategy and building applications using Windows on Pathworks. DEC is a likely partner for Microsoft after losing IBM."

Indeed, the theme of the conference is "Personal Computing Partnerships that Work."

Mike Murray, general manager of Microsoft's Network Business unit, and Paul Maritz, vice-president of advanced operating systems at Microsoft, are scheduled to attend.

Michnoff says DEC and Microsoft will collaborate further on a project called TeamLinks, an effort to develop work group applications for Windows clients on Pathworks LANs using Microsoft's Visual Basic development environment.

Pathworks-Plus' information browser will cost $99, and the electronic conferencing application will cost $129, according to Michnoff. Shipping dates were unavailable at press time.

Dissolving RBHC monopolies

continued from page 4

fice of Plans and Policy at the Federal Communications Commission, agreed that competition in the local loop is inevitable. The FCC has already allowed alternative access providers to collocate equipment in local carrier central offices in order to consolidate private-line traffic and carry it to long-distance carriers. The agency is now considering allowing alternative carriers to compete for switched access services.

Madelon Kuchera, a legal adviser to FCC Commissioner Andrew Barrett, said she expects local competition for most services to emerge fairly rapidly. "I wouldn't be surprised to see, by the end of the decade, instances of switched voice competition," she said.

Pepper agreed, noting that one of the major forces driving competition in the local loop will be businesses wanting to use new wireless local-area networks and private branch exchanges.

More than 50 firms have applied for experimental licenses to test voice and data PCNs that allow users to communicate, regardless of their location, via small wireless handsets. Unlike traditional cellular services, which rely on terrestrial networks for some portion of transmission, PCNs are self-contained.

Ruth Kretschmer, a commissioner on the Illinois Commerce Commission, said states are moving to introduce competition in the local loop.

She said the trend toward competition will likely continue "because the market forces already unleashed will continue to knock on federal and state regulators' doors."

However, Kretschmer urged regulators and others to move slowly in introducing competition.

"In my judgment, competition is not an end in itself; it's a means to an end," she said. "The end we are trying to achieve is more and better service."

EC ministry backs reforms

continued from page 2

tions by implementing reforms proposed by the CEC and approved by the European Parliament.

Due to the EC's labyrinthine procedural rules, the council must vote once more to approve the leased-line directive before it is implemented. But since the directive received unanimous support last week, it is expected to be easily approved a second time.

Derek Nicholas, EC liaison for INTUG-Europe and a vice-president at Citibank, N.A. in London, said the council is likely to adopt the leased-line directive within four months. Countries would then have a year to comply.

The leased-line directive is aimed at rectifying fundamental regulatory and technical problems that make it extremely difficult for users to build pan-European private networks.

Currently, each Common Market country maintains different private-line regulations that are sometimes exceedingly restrictive, especially by U.S. standards. For example, users say some countries bar them from routing voice traffic over private lines.

The directive would require member countries to drop such restrictions and support a minimal set of private-line services — including analog, 64K bit/sec and E-1 private lines — based on common technical standards.

INTUG officials said this is important because digital private-line services are not widely available in Europe. Also, some carriers are trying to phase out analog private-line services as they move to digital services.

Nicholas said the leased-line directive would enable users to file a formal protest with the CEC if a carrier refused to provide a specified private line between any two points in the Common Market countries. The CEC could force the carrier to provision the circuit or give users permission to install bypass facilities, such as private satellite links.

Additionally, the directive would require carriers to publish statistics on the average time required for them to provision new circuits and fix outages. They would also be requird to support one-stop shopping and billing for pan-European nets and base private-line tariffs on actual provisioning costs.

The council's satellite resolution gives the CEC a year to draft new regulations that force Common Market countries to allow competition in the provision of satellite services and equipment, according to a CEC official who requested anonymity. The council could then take another year to adopt the proposals, and the Common Market countries would probably have an additional year to implement the changes.

Currently, nearly all Common Market countries, except Germany and the U.K., grant their state-owned carriers monopolies over provision of two-way satellite services and earth stations. CEC officials contend that carriers abuse these monopolies by charging inflated prices and steering users toward terrestrial services.

Firm rethinks recovery plan

continued from page 29

to find out why its electronic vaulting had stopped.

Also, by moving its electronic vaulting equipment into the adjacent hot site, Comdisco prevented Sea-Land from moving its own equipment into the facility for a planned disaster recovery test. Now Sea-Land will have to delay the test for months.

Trombetti complained that Comdisco did not have a backup diesel generator at the site that could have been quickly activated after the transformer failure.

According to Trombetti, Sea-Land has signed contracts to use Comdisco's electronic vaulting services for another three years and the company's hot-site services for another five; however, Sea-Land's lawyers will examine the contracts to see if the company can get out of them.

Jackson refused to comment on specific customer problems. However, he added that any disaster recovery vendor can lose a hot site or an electronic vaulting center. Additionally, he argued that Comdisco was in a relatively good position to handle this outage because it has many disaster recovery centers that can back up the others.

Sprint Int'l seeks partners

continued from page 35

U.S. service providers, he added.

"There doesn't seem to be the same degree of time pressure among foreign carriers that we see here in the U.S. for the provision of the service," Guidi said.

But he predicted that foreign carriers will feel greater pressure to offer domestic and international public frame relay services as more multinational companies begin using public frame relay services in the U.S. "Clearly, our domestic customers will begin to create some pressure on the foreign markets," he said.

Private-line expansion

In the interim, US Sprint is working to increase the reach of its international private-line and Global Virtual Private Network (VPN) services. Sprint International, for example, plans to expand its international private-line services to 22 European countries, up from the 17 currently supported, according to William Blessing, Sprint International's vice-president of telecommunications services and products.

Sprint International this year also began its first international private-line service to the Pacific Rim by rolling out that offering in Australia, Hong Kong, Japan and Taiwan. The carrier plans to expand the service to Singapore and South Korea later this year.

Traditionally, AT&T and MCI Communications Corp. have offered international private-line services to many more countries than Sprint International. But Blessing said Sprint International is narrowing the gap quickly.

Guidi said he believes that international virtual net services such as Global VPN will eventually become more important than international private-line services as users increasingly move international voice traffic off private nets and onto the public net.

As for the more distant future, Guidi said he thinks the industry will see the emergence of a viable market for managed bandwidth services that enable users to receive international bandwidth during set times.

In contrast to switched digital services, where users may not be able to obtain bandwidth if a circuit is busy, managed bandwidth services come with guarantees that bandwidth will be available when users need it.

Carriers, including British Telecommunications PLC (BT), are touting managed bandwidth as a major component of their emerging global private net outsourcing services.

But Sprint International is unsure whether managed bandwidth services would be better supported via time-division multiplexers (TDM), as BT is doing with Syncordia Corp., or via emerging Asynchronous Transfer Mode (ATM) switches, Guidi said. ATM switches would probably utilize broadband bandwidth more efficiently than TDMs, he added.

If users continue to move voice and video traffic from private nets to the public switched network to take advantage of services such as Global VPN, then the multimedia capabilities of ATM might not be needed, Guidi said. Instead, Sprint International could support users' emerging managed bandwidth requirements with frame relay services running at speeds greater than T-1.

Frame relay, unlike ATM, is not well equipped to carry voice and full-motion video, he said.

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Reach enters realm of work flow

continued from page 1

tions on how these forms are to be routed and processed in the organization.

Jagannathan said intelligent routing of these forms and messages by WorkMAN can simplify operations — many of which are paper-based today — and improve productivity.

Filling a vacuum

Analysts agree this is a significant new LAN application.

"Work flow management is an important new way for users to rework existing business practices; there's nothing else quite like it," explained Peter Kastner, vice-president of Aberdeen Group, Inc. in Boston. "Reach is there first and should fill a vacuum."

WorkMAN includes the WorkMAN run-time platform in addition to WorkMAN Tools, which work with Novell, Inc. NetWare and Banyan Systems, Inc. VINES networks. As a development platform, WorkMAN provides a set of Visual Builder tools for building object-oriented applications.

These tools consist of the Form Tool, which graphically paints a form structure, and the Workflow Tool, a program generator that automatically creates scripts to coordinate work flow stages, define routing decisions and specify alternatives that are triggered by "action buttons." An action button can include such things as a check request that requires a higher approval level and an additional layer of message routing.

New application type

The final offering from WorkMAN Tools is an application type that consists of an application description, generated scripts and associated forms or objects.

The WorkMAN run-time platform includes WorkManager and the User Interface. WorkManager is designed to manage application types and coordinate the steps in the work flow process. For example, WorkManager determines if a form should be routed based on the contents of the form, the status of a message or certain action buttons.

The server-based WorkManager is built on top of Novell's Btrieve database, as well as a mail application program interface (MAPI), which initially supports Novell's Message Handling Service (MHS) in addition to VINES Mail.

The client's User Interface is Microsoft Corp. Windows-based and enables an end user to launch a work flow application, access and manipulate form objects, connect to the mail-transport layer and integrate messages with other applications.

In addition to MHS and VINES Mail, Reach has announced that it will support Microsoft's MAPI and Lotus Development Corp.'s Open Messaging Interface for cc:Mail users. Reach may add OS/2 Version 2.0 client support if customer demand warrants.

Since applications may require links to other programs, WorkMAN supports Windows' Dynamic Data Exchange.

Work flow systems being prototyped for users such as Pacific Gas & Electric Co. and Varian Associates include bid routing and tracking, engineering change notice management and software distribution.

WorkMAN is targeted at LAN sites consisting of a few servers in a work group to enterprise nets supporting hundreds of dispersed LANs.

Reach
MailMAN
Windows Based Management System for VINES Mail

PHOTO ©1991 PAUL BUCK

Anand Jagannathan, founder and president of Reach

Jagannathan said users are ready to move beyond basic file and print sharing applications but acknowledged that applications such as work flow will test the limits of existing LANs.

In order to support such applications, LAN vendors will have to provide robust wide-area connectivity, gateway services, capable directory services and integrated LAN administration services.

The WorkMAN Open Platform License, supporting an unlimited number of applications and including the WorkMAN server license for five users, costs $2,495, with additional five-user licenses priced at $1,495 each. A WorkMAN run-time license for one work flow application type costs $995. WorkMAN Tools costs $995.

WorkMAN will be available in the first quarter of 1992. ◼

Owens-Corning tags HP for design

CUPERTINO, Calif. — Owens-Corning Fiberglas Corp. is using Hewlett-Packard Co.'s Open Software Environment (OSE) consulting service to devise a customized open systems architecture that would support distributed computing applications.

"We decided to move to an open, distributed computing environment a few years ago, but frankly, we didn't make much progress until we asked HP for help," said Bill Whitten, a technology assessment and planning specialist at Owens-Corning in Toledo, Ohio. "We are interested in open systems not to gain vendor independence, but to more easily scale and change our computing environment to meet changing business needs and user demands so we don't have excess capacity."

HP's OSE consultants worked with a team of Owens-Corning information technology planners to evaluate the manufacturer's current computing environment, map out an open systems architecture and draw up a migration plan.

Owens-Corning currently has a multivendor computing environment, including IBM MVS and VM mainframes that support 3270 terminals, as well as a variety of HP 9000 and 3000 systems running on MPE, Unix or IBM Personal Computers.

The target architecture developed during the workshop was designed to meet Owen-Corning's need to support client/server applications. The architecture specifies MS-DOS- or Unix-based clients, a front-end application server running Unix and multiple back-end data servers in each business department that runs Unix, IBM's MVS or HP's MPE operating systems.

— *Wayne Eckerson*

Network outage woes continue

continued from page 5

"From an architectural standpoint, the network is flawed," agreed Len Evenchik, director of communications for the Office of Technology Planning for the Commonwealth of Massachusett's MIS group. "The network shouldn't be built so that the northeast corridor is lost if they lose the Blackstone center."

AT&T said the DACS failed during routine maintenance to replace hard disk and tape drives. The same maintenance was also performed in the carrier's Boise, Idaho, Dayton, Ohio, and Detroit DACS centers without incident.

The DACS malfunctioned at about 8 p.m. on Tuesday. Rerouting traffic around the center enabled AT&T to restore switched services by 10:30 p.m. and private-line services by midnight. The DACS were not fully restored until about 1 a.m. on Wednesday.

But AT&T was not alone.

MCI Communications Corp. suffered a service interruption of its own last week when an unspecified number of calls entering and leaving Washington, D.C. were blocked because of a switch hardware problem.

Service was interrupted at 5:30 p.m. on Wednesday and fully restored about a half hour later. MCI would not discuss the cause of the problem nor the type of switch.

In addition, US Sprint Communications Co. lost partial operation of one of its Northern Telecom, Inc. DMS-250 SuperNodes in its Pennsauken, N.J., switching center from 5:35 a.m. to 8:1 a.m. last Wednesday.

The carrier is blaming the outage on a software glitch.

Repercussions on the Hill

The outages are likely to hav a heavier impact in Washington D.C. than they had on the carriers' customers. The rash of outages are expected to increas pressure on the Federal Communications Commission to se strict network service availabilit levels for carriers.

"There can no longer be an question that network vulnerability is a problem of critical proportions," said Rep. Bob Wise (D W.Va.), chairman of the Hous Government Information Subcommittee. "It's time for the FC — and I mean from the chairma on down — to acknowledge th severity of the situation."

Wise said the FCC should focu its attention on the issue of network vulnerability. "If the FC doesn't make telecommunications reliability its top priority we will all suffer the consequences."

James Spurlock, special assistant to the chief of the FCC's Common Carrier Bureau, said, "AT& does not have a firm answer ye [on exactly what caused the outage], but some sort of human error was possibly involved. Thi raises serious concerns at th FCC about the management oversight and AT&T's commitment t provide reliable service." ◼

Ellen Messmer also contributed to this report.

HP service aids open systems

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of user companies that have implemented open systems to support client/server and transaction processing applications, among other things.

HP's Cory makes no bones that one of the company's goals with OSE is to penetrate new accounts among Fortune 500 firms. However, she added that OSE consultants will not push HP hardware or systems.

> "You may lose some objectivity, but you gain some expertise," Kidd said.
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"Unlike IBM or DEC, we aren't recommending that users adopt a specific architecture that requires them to implement our products. We look at customers' legacy systems and then help them choose the best softwar and standards to meet their ope systems objectives," Cory said.

But Robert Kidd, senior industry analyst at Dataquest, Inc., market research firm in San Jose Calif., questioned whether H can really maintain objectivit when making recommendation about standards and products.

He added, however, that HP' experience in building open systems products gives it a depth o understanding that traditiona management consultants ma not be able to offer. "You ma lose some objectivity, but yo gain some expertise," Kidd said.

Judith Hurwitz, vice-presiden of Patricia Seybold's Office Computing Group, Inc. in Boston, sai that of all hardware vendors, H has the best chance of making consulting service such as OS work.

"Users tend to trust Hewlett Packard more than other vendor because the company alread provides excellent service an support," Hurwitz said. "HP's approach is credible because the are primarily recommending AP specifications, not products — even though, ideally, they woul like customers to buy HP hardware." ◼

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IBM MCA-based PC outshines foregoers

WHITE PLAINS, N.Y. — IBM last week unveiled a new version of its Token-Ring Network 16/4 Adapter A for Micro Channel Architecture-based personal computers that performs 80% faster than its predecessor.

The improved performance means users of the new adapter should be able to access information across networks faster and more efficiently.

IBM attributed the performance hike to a software upgrade on the adapter that enhances its I/O and instruction processing operations.

The adapter card can be used in personal computers, servers and Personal System/2-based bridges when used with the IBM Token-Ring Network Bridge Program. Because the card is designed to fit in a half-sized slot, it can also be used in the portable PS/2 Model P70.

"This makes us very competitive in the marketplace," said Curt Dunbar, local-area network product planning manager for IBM. "There have been shoot-outs in the past, and the Micro Channel adapter was showing it didn't have the throughput capability the other systems had."

This upgrade does not support full 16M bit/sec transfer rates for all frame sizes, but "it does make us very competitive, and if we did a shoot-out again, we wouldn't be at the bottom of the list," Dunbar said.

The new capabilities include the ability to distribute software to large numbers of remote personal computers, including diskless personal computers, from a server or host personal computer equipped with the adapter card. This feature comes standard on the card, whereas IBM used to charge $99 for it.

IBM hopes to eventually integrate unshielded twisted-pair filters with the adapter card in line with its plans to offer 16M bit/sec Token-Ring over unshielded twisted-pair products next year, Dunbar said.

The IBM Token-Ring 16/4 Adapter A is priced at $895 and is available now.

— Bob Brown

ILAN's algorithm is boon to SNA

continued from page 1

ing the new algorithm internally. CrossComm intends to announce new ILAN software supporting the algorithm in the first quarter of 1992 and to ship it early in the second quarter, Witkowicz said.

That schedule will put the company on a collision course with Cisco Systems, Inc., which is planning to roll out support for SNA PU Type 4 routing on its bridge/routers.

CrossComm's approach is an alternative to the PU 4 implementation that provides enhanced performance and rerouting capabilities, while stopping short of full-blown SNA routing.

Don Listwin, Cisco's product-line manager for routers, said the company considered an algorithm similiar to CrossComm's but decided it would not work in large internetworks.

"We don't think it's a good idea because it requires cumbersome address and directory tables," Listwin said.

But Witkowicz noted, "Users don't want anybody other than IBM meddling with front-end processors, VTAM and SNA routing. That's already done. IBM does that. That's SNA."

CrossComm would not be the first to support a variation of SPF.

Other bridge/router vendors, including Wellfleet Communications, Inc. and Proteon, Inc., are currently shipping support for the Open Shortest Path First (OSPF) algorithm. Cisco plans to support OSPF on its bridge/routers by early next spring.

Even CrossComm plans to support OSPF next year, Witkowicz said. But OSPF has shortcomings that CrossComm's algorithm will overcome, he said.

Token-ring LANs must be bridged together using source routing, which finds the best path through the network at the time a session is established.

But source routing has limitations. For one, packets can only make seven hops before reaching the destination node. Also, once a route is established, it is used for the duration of the session. If a session has to be rerouted due to a failure, which typically lasts about a minute, it can break down.

Vendors such as Cisco, Wellfleet and Proteon get around that by encapsulating packets from token-ring LANs in Internet Protocol packets. IP doesn't limit the number of hops and supports more flexible rerouting. OSPF, or a proprietary algorithm like Cisco's Interior Gateway Routing Protocol, is then used to find the best path between routers.

That strategy presents a problem for the many users that configure token-ring nets with dual routers, Witkowicz said.

Source routing establishes the session and picks one of the two routers, based on destination information provided when the session is established. But only after a session is lost and must be reestablished will there be an opportunity to use the alternate router, he said.

ILAN routers, unlike competitive products, keep tables on which devices are attached to what networks. That information is used by the new algorithm to constantly ensure that data is following optimum routes.

If an existing route becomes congested or fails entirely, a session can be automatically rerouted along a different path without interruption, Witkowicz said.

"We don't agree that OSPF can't be used in token-ring nets to achieve the same results," said Karen Barton, director of product marketing at Wellfleet. "Both can be used to make the best decision if something fails and rapidly respond to change to preserve SNA sessions."

Users welcomed the CrossComm enhancement. "If it would preclude my user from having to reestablish a session, that would be fantastic," said Steve Coppel, telecommunications executive at First National Bank of Maryland in Baltimore.

Software gives LAN users access

continued from page 5

(DMSI) should receive the request and passes it on. Each DMSI permits access to a certain target DBMS, such as IMS or DB2.

Users must buy a server-resident DMSI for each DBMS they wish to access within their enterprise, according to Bronson Purdy, vice-president of marketing and sales at Cross Access.

The DMSI translates the SQL statement into the specific language needed to access the target DBMS. It accesses the DBMS, retrieves the requested information and routes it back.

Cross.Access is positioned to compete with an offering from Information Builders, Inc. (IBI) called Enterprise Data Access (EDA)/SQL. Cross.Access provides an SAA-compliant SQL interface that enables it to be used on any SAA-compliant hardware platform, whereas EDA/SQL uses a proprietary SQL interface.

In addition, Cross.Access offers TCP/IP access to VMS computers, whereas EDA/SQL supports only LU 6.2, giving users a choice of transport, Purdy said.

Cross.Access is currently available for the MVS environment. Pricing is based on configuration and platform. A base configuration running MVS with access to DB2, VSAM and IMS costs $192,500.

IBM, SynOptics devise scheme

continued from page 1

LAN product planning manager for IBM.

Dunbar said IBM believes there is still a role for shielded twisted-pair wiring too, especially for supporting many users on a network and providing a migration path to higher speed nets.

Industry observers applauded the announcement. "This is a great day for token ring," said Carl Blume, senior product manager for network interface cards at Proteon, Inc., IBM's chief rival in the token-ring market.

A boost for token ring

Given IBM's dominance in the token-ring market and SynOptics' leadership in the wiring hub market, the joint proposal should broaden the market for token-ring products and could drive completion of a standard before 1993.

Ed Peters, communications engineer supervisor for Florida's Division of Communications in Tallahassee, said this is good news. "The major vendor of token-ring products is legitimizing [unshielded twisted pair]," Peters said. "I think the customer demand is there for it."

Prior to entering the market, IBM wanted to make sure it could support 16M bit/sec token ring over unshielded wire at distances up to 100 meters between wiring closets and workstations. Big Blue also wanted to support at least 130 workstations on a LAN, or half of what shielded wire can support, Dunbar said.

The IBM-SynOptics proposal calls for a retiming device to be implemented at each port of a wiring concentrator so signals can be regenerated and retimed before reaching a workstation adapter card, said Peter Tarrant, group manager for connectivity products at SynOptics. This active system serves to boost the data signal so that it won't fall victim to line noise, he added.

Dunbar stressed that the IBM-SynOptics technology is consistent with the IEEE 802.5 work to date. "We're hoping that since our proposal is not a big change from what the standards body has been looking at, this will help bring closure to the standards activity faster," he said.

By teaming with IBM, SynOptics hopes its proposal will become a de facto standard and lead to the completion of a standard, so users will easily be able to mix and match different vendors' gear as they do with 10Base-T, said Bill Lanfri, vice-president of marketing at SynOptics.

"The technical challenge to do this has been quite complex," he said. "16M bit/sec token ring runs 60% faster [than Ethernet], which causes more signal attenuation, cross talk and radio frequency emission problems than were faced with 10Base-T."

While SynOptics and IBM declined to detail new products based on the token-ring technology, Tarrant said the vendors will need to add circuitry to handle retiming on the cards or ports within their concentrators.

The technology will be the basis for IBM's 16M bit/sec Token-Ring over unshielded twisted-pair products, said Bob Love, a senior IBM engineer.

IBM plans to allow existing 16M token-ring adapter cards for shielded twisted-pair networks, such as its new Token-Ring Network 16/4 Adapter A for Micro Channel-based personal computers, to fit into unshielded twisted-pair networks by adding an external filter to the cards, Love said (see "IBM MCA-based PC outshines foregoers," this page).

New cards could be built with the filter on board, he added.

IBM plans to announce products supporting the technology next year, according to Dunbar.

Also, SynOptics plans to come out with products based on the new technology in the near future, though company officials declined to be more specific. The products will interoperate with SynOptics' current shielded and unshielded twisted-pair token-ring products as well as IBM's Token-Ring products, Lanfri said.

NETWORK WORLD

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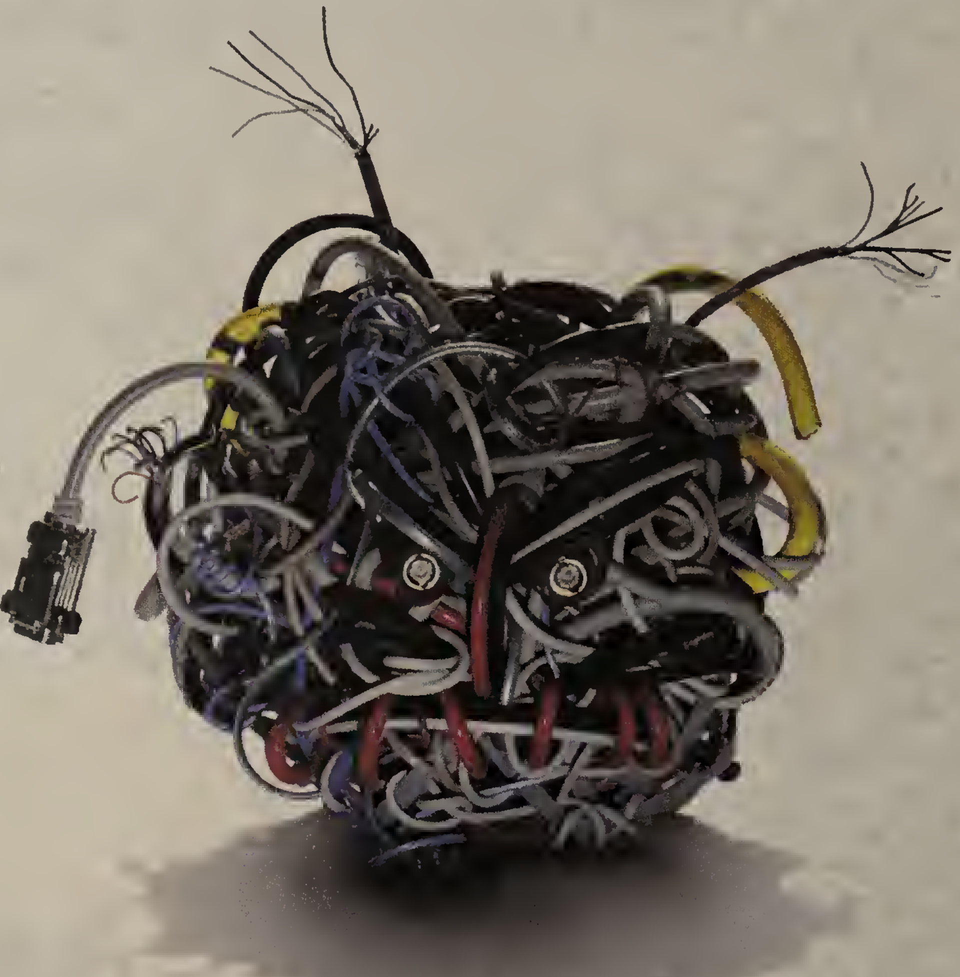

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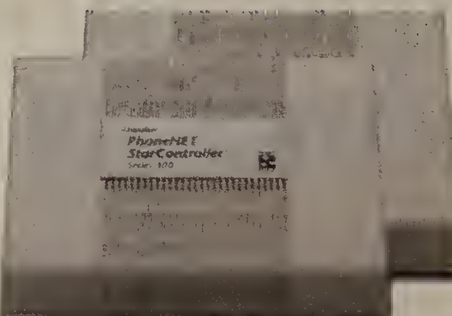

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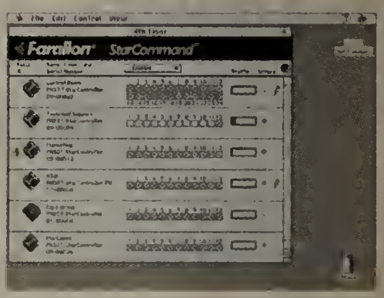

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